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ARTICLE I.

PHYSICAL CONDITIONS ESSENTIAL TO THE PRODUCTION OF TYMPANITIC RESONANCE, AND PATHOLOGICAL STATES OF PULMONARY TISSUES IN WHICH IT OCCURS.

By R. H. BABCOCK, M.D., *Chicago.*

That deviation from the normal vesicular percussion note of healthy lung tissue, known as tympanitic resonance, is so significant a diagnostic sign, that I trust a few remarks upon the physical laws and pathological conditions favoring its development may not be out of place. Percussion derives its diagnostic import from the law of physics, that bodies, when struck, emit a sound whose quality, intensity, pitch, and duration are in accordance with the composition and molecular arrangement of the body struck. The quality of this sound is said to be sonorous or non-sonorous, according as the body emitting it does or does not contain air. The conditions of the human organism are such that, in percussing over its various internal viscera, we can only discriminate a difference in sound with relation to the presence or absence of air in the organs. Hence

the percussion note is either resonant or non-resonant, clear or dull. Yet it is highly probable that were the human ear sufficiently delicate in its sense-perception, it would be able to detect differences in the quality of the sounds emitted by the various viscera that are devoid of air; this difference in the quality of the sounds being dependent upon variations in the structure of the vibrating organs. Thus, the liver would give forth a sound of different quality from the spleen, that of the heart, again, differing from either of these. As it is, we only recognize a common character in the percussion note of these and other solid or airless viscera, viz., flatness.

But when we come to percuss over those which contain air within their walls, the stomach intestines, and respiratory organs, we are struck with the fact that the sound elicited is not always the same. The healthy lung tissue gives forth a tone peculiar to itself; and this "vesicular sound," as it is called, is very unlike the sound produced by striking the larynx, trachea, stomach, or bowels. The sound of these, in turn, differs in intensity, pitch, and duration, according to the organ whence it issues; yet it maintains a uniform quality which imparts to its individuality and whence its name, *tympanitic;* though to distinguish the locality of its production, it is severally called, laryngeal, tracheal, gastric and intestinal. Let us now inquire, What is it that gives this tympanitic note its individuality? Why should the air contained in the stomach, when set in vibration, emit a different tone from that of the lungs? Evidently it must depend upon conditions located in the enclosing walls that modify the character of the vibrations. The tympanitic sound, when analyzed with reference to its musical composition, is found to be made up of not merely one single tone, but of a keynote or "tonic" together with its over or secondary tones, whether these be "harmonics" or not; whereas, the normal vesic-

ular note of the lungs is composed of but a single tone. Wintrich, who has investigated this subject most elaborately, found that when, by means of the acoustic flame, the vibrations of tympanitic and non-tympanitic sounds were compared, they displayed a striking contrast. The tympanitic sound consists of from six to ten regular vibrations that follow each other at regular intervals, increasing gradually in length until the maximum is reached, and then decreasing in the same manner.

The vibrations of the non-tympanitic sound, on the other hand, are seen to be irregular, both in height and succession.

But this knowledge of the character of its vibrations does not enable us to understand the physical conditions requisite to the generation of tympanitic resonance. Thanks to the painstaking experiments and observations of Wintrich, Gerhardt and others, chiefly Germans, we are able to formulate the following law, viz.: "A tympanitic note is produced when, by percussion, the column of air within a hollow cavity of regular form, and smooth not too tense walls, is set in vibration." (Gerhardt.) These conditions are found normally in the human body in the larynx, trachea, gastric, and intestinal cavities. Please notice that one of the essential conditions mentioned is, that the walls be *smooth* and *not* too tense, in other words, capable of reflecting vibrations. That smoothness of the walls is a prime essential to their reflecting ability, is well illustrated as follows: If percussion be practiced over a glass vessel which has been pressed down into a mass of snow, the sound elicited will be tympanitic. If the glass be now taken away, the cavity thus left will give a *non*-tympanitic note. This is because the walls of snow, unlike those of glass, are not smooth enough to reflect the soniferous vibrations; if the walls be very *tense*, they are *likewise* set in vibration by percussion, and themselves emit a tone,

which obscures the tympanitic quality of the sound of the vibrating air. Therefore, according to Gerhardt, the lungs give out, under percussion, a non-tympanitic note, because of their too great tension. When partially relaxed under pathological conditions, or when taken out of the thoracic cavity, they sound, on the contrary, tympanitic. If the normal percussion note of the stomach and trachea be compared, the pitch of the latter will be found to be much higher.

Investigations have shown the *pitch* of the tympanitic sound to be subject to the following law, viz.: "The shorter the column of vibrating air, and the wider the opening with which the cavity communicates with the *outer* air, the higher the *pitch.*" (Gerhardt). This can be demonstrated by percussing the trachea and cheek, first with closed, then with open mouth.

Furthermore, it has been discovered that if a mass of foam, as of the white of egg beaten to a froth, be percussed, it will sound distinctly tympanitic, the pitch being directly proportionate to the size of the mass of bubbles set in vibration.

Likewise, a beer glass filled with the foam of ale or other malt liquor, will convey a veritable tympanitic percussion note to the ear of the experimenter. In this instance, also, the pitch follows the law laid down: the greater the bulk of foam percussed, the lower the tone, and conversely.

Bearing in mind, now, the conditions above stated as favoring the development of tympany, viz.: an air-containing chamber of regular form, whose walls are smooth and not too tense; and the admixture of air and liquid within a receptacle; and also considering the anatomical structure of the lungs and air tubes, together with the physical laws governing the transmission of vibrations,—keeping these things clearly in mind, we repeat, we shall be able to understand and interpret the morbid

states of the pulmonary tissues in which we find tympanitic resonance on percussion. Let us now briefly consider them.

When a cavity is formed within the lungs, either by the dilatation of a bronchus, "bronchiectasis," or by destruction of the pulmonary tissue, through gangrene, abscess, or caseous degeneration, such cavity will give forth a tympanitic percussion note, if it comply with the conditions required. That is, if it have a regular outline and smooth walls, be occupied wholly or in part by air, and not too deeply located. If it communicate freely with a bronchus, the trachea, and thus with the outer air, its percussion sound will vary in pitch with the opening and closing of the mouth of the patient. The height of the sound emitted is also dependent upon the size of the cavity, or, in other words, upon the length of the vibrating column of air. Cavities are rarely round, but are generally longer than broad; hence, if they contain, in addition to air, liquid capable of shifting its location in response to the force of gravity, the diameter of the cavities will change accordingly, and thus affect the pitch of the percussion note. For example: if the long diameter of a cavity correspond with the antero-posterior axis of the body, and contain fluid, this liquid will occupy the floor of the cavity so long as the patient is standing or sitting, gravitating at once to the posterior extremity of it upon his assuming the dorsal decubitus. Now, the pitch of the percussion note over such a cavity is lower in the first instance and higher in the second. This is easy of explanation: in such a case, when the fluid fills the bottom of the cavity, and percussion is made over the anterior end of this latter, the vibrations traverse the entire length of the antero-posterior diameter of the cavity; when, on the other hand, the long diameter of the space is shortened, by the gravitation of the liquid to the posterior extremity, the vibration can only travel a shorter distance,

and hence the pitch of the sound is raised. This alteration in the pitch of the tympanitic percussion note is called after Wintrich, who first directed attention to the phenomenon; and when this change of pitch is determined by variation in position it offers strong corroborative evidence of the presence of a cavity. It is not easy to determine the dimensions of the smallest cavity that is capable of generating tympany. It is often unmistakable in those of the size of a pigeon's egg, and may even be heard, under favorable circumstances, when the cavity is not larger than a hazel nut.

Another pathological condition favoring the production of tympanitic resonance, is the consolidation of a portion of lung surrounding a bronchus. Normally, the air within a bronchial tube, that has a tolerably direct communication with the trachea, is not thrown into soniferous vibrations by percussion, for the simple reason that those generated by percussion in the air of the pulmonary vesicles are dispersed and lost in traversing the alveolar network. But when the lung structure is changed by consolidation, it is rendered capable of transmitting with sufficient force the impulse imparted to it to create vibrations in the air contained in the broncho-tracheal tract; and this occasions a tympanitic sound, whose pitch rises and falls with the opening and shutting of the mouth (becoming lowest of all when both mouth and nose are closed), but remaining uninfluenced by the position of the patient's body. Its pitch, furthermore, corresponds to that of the broncho-tracheal respiratory sound, as determined by auscultation. As it is often extremely difficult to differentiate this condition of affairs from the existence of a deep-seated cavity, the effect of position upon the pitch of the tympanitic percussion note may be tested.

Since, as seems most probable, the normal percussion sound

of healthy lungs is non-tympanitic by reason of the too great tension of these viscera, it follows that any condition of disease affecting their relaxation will favor the development of tympanitic resonance. Thus, in pleuritic effusions, we often detect this quality of the percussion sound immediately above the level of the fluid. Here the normal tension of the lung is overcome by the pressure of the effused liquid; and thus relaxed, the organ yields a tympanitic percussion note, whose pitch, as might be expected, does not change with the opening and closing of the mouth, since the air vibrating within the alveoli does not communicate directly enough with that in the trachea and larynx. When, however, the effusion is great, it is found, according to Gerhardt, that the pitch of the tympanitic note is higher in the upright than in the horizontal position. Moreover, this quality of the percussion sound above the level of the fluid is most evident anteriorly, near the sterno-clavicular articulation. In pneumo- and hydropneumo-thorax we obtain this same quality of sound; but here the explanation is different. To be sure, the lung relaxes its tension and retracts before the air entering the pleural cavity, whether its door of ingress be through a wound in the parietes, or a perforation, by ulceration, in the pulmonary pleura. But in this case the sound is generated by the vibrations of the column of air that intervenes between the chest wall and the retracted lung; and hence the impulsive force of the percussion shock fails to reach the relaxed pulmonary tissue. In pneumo-thorax the pitch is not influenced by change of position. Intra-thoracic tumors and a greatly enlarged heart may also so compress the lung as to favor the development of the tympanitic resonance in their immediate vicinity. Gerhardt also mentions as a clinical fact that, if a portion of a lung become greatly distended by an exudation, as in pneumonia, the adjacent parts undergo sufficient relaxation to give

forth a tympanitic percussion note. I can not explain the mode of occurrence of this decreased tension of the parts surrounding a zone of consolidation, unless on the ground that the distended alveoli encroach upon those that have remained free, and by thus offering some impediment to the ingress of inspired air, interfere with the customary expansion of the pulmonary vesicles. And of course the natural tension of the lungs is dependent upon their normal expansion.

Finally, a condition which is capable of giving rise to tympany, and whose laws are not fully understood, is the presence of air and fluid at the same time within the pulmonary vesicles. This is easily demonstrated upon the cadaver. If water be injected into the cells of the lungs, yet not in sufficient quantity to expel all of the air, they will yield tympanitic resonance, which, as the pulmonary vesicles become entirely filled with liquid, gives place to flatness, and, on the other hand, returns to true vesicular resonance with the expulsion of the fluid. Now, a similar condition of things, viz., admixture of air and liquid, is present in œdema pulmonum, and in the first and third stages of pneumonia. At these times it is often possible to elicit a distinctly tympanitic quality of the percussion note. Therefore, in cases where it is not always easy to differentiate between pleuritis with slight effusion and the first stage of pneumonia, the detection of a faint though unmistakable tympanitic ring over the area of dullness, will serve to establish a diagnosis. Unfortunately, however, this quality is not always marked enough to be perceived, yet should be diligently sought for in doubtful cases. True tympanitic resonance in pulmonary emphysema is rare. Yet when it does occur it is difficult of explanation, and is probably dependent on some modifying circumstances not yet understood. In conclusion, let us consider, for a moment, one or two conditions, where, with the

lungs perfectly healthy, the variety of resonance under discussion may be obtained in examination of the thorax. Occasionally, when the stomach or bowels are greatly distended with flatus and ride high up under the diaphragm, vigorous percussion over the base of the lungs will, in persons with elastic parietes, give tympanitic resonance; this is readily explained by the fact that the impulse imparted to the chest walls is conducted to the flatulent viscera and sets their contents in vibration. The same cause operates when the "cracked metal sound" is sometimes elicited by the forcible percussion of the chest of a young child suffering with bronchitis, a condition where cavities can manifestly not exist. Again: Friedrich, in his work on diseases of the heart, narrates the case of a woman who was ill with pericarditis. A few hours prior to her death a high-pitched tympanitic percussion note was elicited over the præcordia, and at the autopsy the pericardium was found distended with fluid and gas. Such instances are of extreme rarity.

ARTICLE II.

OUR CHILDREN'S EYES AND BOOKS. *By* F. C. HOTZ, M. D. *Chicago.*

A child is seldom born near-sighted, and an adult past the twentieth year scarcely ever gets near-sighted, though his occupation (as watchmaker, for instance) may demand the constant use of his eyesight at a very short range. But although the most children enter school with good eyesight, the experience all over the world has shown that a great many children leave the school near-sighted. Within the past ten or twelve years numerous examinations of the eyes of school children (between six and sixteen years) were made in every country of the civilized world; and whether the reports come from Germany or France, from England or Russia, from Switzerland or our own country, all the statistics prove that there is more or less near-sightedness in every nation, and that the percentage of near-sighted pupils increases in all countries (in some countries at a frightful rate), from the lower to the higher grades in each school, and from the common schools to the high schools and colleges. On the other hand, it is a fact that near-sighted eyes are not found among the uncivilized races.

These observations and facts have lead to the conclusion that there exists an intimate causal relation between the occupations of our children during the period of school life and the development of near-sightedness, and that reading and writing are the occupations which, under certain conditions, act so injuriously upon the eyes of children. The sclerotic of their eyes is thin and extensible; its form, therefore, may possibly be influenced by tension and pressure; and as the size of the eyeball is principally determined by the shape of its sclerotic, the same forces which can change the shape of the latter will

necessarily change the length and breadth of the eyeball.

During reading and writing we must adjust the focus and the visual axis of our eyes to the distance at which the book is placed. Both these adjustments (accommodation and convergence) are executed by the contraction of muscular fibres (the ciliary and recti muscles), and it is supposed that by the long-continued and oft-repeated tension and pressure upon the eyeball, associated with these muscular contractions during accommodation and convergence, the extensible sclerotic of a child's eye can be stretched and the eyeball be elongated, and so become near-sighted.

Here the question might be asked, If this theory be correct, why do not all eyes become near-sighted, as all school children have to read and write? This question can be answered with the same explanation which we give in accounting for the fact that some children's health suffers seriously by the same amount of school work which other children can do with the greatest ease and comfort. We speak of robust and delicate constitutions to indicate the different degrees of endurance for physical or mental work which different individuals possess; and we may with the same propriety speak of robust and delicate eyes to explain the different effect the same amount of school work produces upon them. A child with robust eyes will at the end of his school period still enjoy perfect eyesight, while the delicate eyes will break down under the same amount of work and become near-sighted.

The degree of endurance of the eye, the greater or less tonicity of its tunics, is largely dependent upon the constitutional character of the whole organism. The robust children, as a rule, are blessed with good and strong eyes, while the weak and delicate constitutions furnish the feeble and easily extensible sclerotics of the myopic eyes. And when we are informed

by the statistician that the percentage of near-sighted school children is much larger in cities than in country districts, this is exactly what we should expect to find according to the constitutional differences between city and country children.

If we recognize the important role the constitutional infirmity of a child plays as a predisposing cause of myopia, if we believe the eyes of weakly constituted children are so delicately constructed that their natural growth can be easily disturbed and their shape be altered by the ordinary amount of school work, we understand at once why near-sighted children are found in every civilized country. Our children must get a proper school education; they must read and write; they must apply their eyes upon books; and since in every community there is always a number of delicate children whose eyes cannot endure the efforts of accommodation and convergence, they are doomed to become near-sighted.

Myopia, therefore, is in a certain sense the logical result, the inevitable evil, of our civilization, and will exist as long as this lasts. But while we cannot hope for the complete extermination of this evil, because the predisposing causes are beyond our control, we may expect to mitigate it and to reduce the number of its victims, because the immediate causes of myopia (accommodation and convergence) can be regulated and controlled; for many children who otherwise would grow up to manhood with perfect eyesight become near-sighted because they are allowed to read under disadvantages which overstrain the muscles of accommodation and convergence. All these eyes could be saved by a little care and attention. We should see that our children do not read too long; we should see that they do not read by insufficient light, and we should see that they do not approximate the book too much.

Whatever is said about reading applies to the act of writing,

too; but of the two occupations I regard reading as having the greater influence upon the development of myopia. Unquestionably, a child reads a great deal more than it writes; and when it reads an interesting book its eyes are steadily fixed upon the page and never allowed to rest except when the leaf is turned; while in writing, the frequent interruptions for filling the pen afford to the eyes as many occasions for relaxing the muscles of accommodation and convergence. If, therefore, the continuous and excessive efforts of these muscles produce myopia, they are more likely to produce the injury during the act of reading than during writing.

Children have a natural tendency to hold small objects unnecessarily near their eyes. This tendency is the principal source of danger for eyes disposed to become near-sighted; and parents and teachers cannot be too careful lest this tendency to approximate the book grows into a bad and dangerous habit. Since our children cannot get a proper education without reading and writing; since they must read, we should at least see that they do it under conditions which put the least possible strain upon their eyes. It is, therefore, of the utmost importance to know that eighteen to twenty inches are considered the shortest distance at which children may safely be allowed to read. For this distance the convergence of the visual axis is so slight and the amount of accommodation so small that the muscles of the eyes are not taxed severely. But with every inch by which this distance is shortened the work imposed upon the ocular muscles rapidly increases, and soon causes a degree of tension and pressure dangerous to the soft tunics of a child's eye.

But if we do not want our children to read at a distance less than eighteen inches we must not let them have books with print which it is next to impossible for them to read at the

required distance. *Javal*, *Weber*, *Cohn*, and others who have written on this question of book print, declared that books should not be printed in letters smaller than 1.50 millimeter, and some experts put the limitation even at 1.75 millim. for children's books. Easy and comfortable reading furthermore requires that the lines should be well "leaded;" in other words, there should be an interval of space between the lines of no less than 2.50 to 3 millim.; and it is hardly necessary to mention that the paper must be smooth, firm, and thick to show a clean and clear print. A beautiful specimen of good book print, which can be highly recommended to all publishers, is Solis Cohen's work on "Diseases of the Nose and Throat" (size of letters 1.75 m.). If the reader compare that print with print of this Journal (size of letters 1.50 m.), or with that of the *Chicago Tribune* (local columns 1.00 m.), he will realize the difference between proper and improper print; and by the different effects they produce in his own eyes he may judge what the effect must be upon the tender eyes of children. And he will at once be interested to know what sort of print our children read in school and at home.

To answer this question, I have examined the most books used in the Grammar and High Schools of Chicago; also a number of books at the Public Library which were pointed out as much read by boys and girls; and finally, the magazines for young folks. This examination has brought out some very interesting facts.

Of ten books of the Grammar Schools all but one reached the standard. This one exception is the "School Dictionary;" the words are printed in *agate* (1.00 mill.) and the definitions in pearl (0.75)! and one millim. is allowed between the lines. Just think of the contrast! Now the child's eyes are resting on the large, clear, and easy print of its Reader, and the next

minute they must accommodate themselves to the blurred microscopic letters of this Dictionary. These sudden changes of the accommodation, repeatedly made in short intervals, are a fruitful source of spasm of accommodation among children. If any fiend attempted to ruin the eyes of our children he could not hit upon a better device than this School Dictionary. It cannot be condemned in too severe language, and no school board with a heart for the welfare of the children should tolerate its use in the schools. If the teachers cannot give the proper definitions of such words as children eight or nine years old use and read, if young children must use a dictionary, let them at least have one with decent type.*

The fourteen High School books I examined make a very good record; all have good paper, the text is printed in letters of 1.75 mill. in ten and 1.50 mill. in four books; the interlinear space 3 mill. in six, 2.50 in eight; only in the notes the type is reduced to 1.25 mill.

In the twenty-three books of Fiction at the Public Library the paper was not of uniform quality; in ten it was good; in eight fair, and in five positively poor. *None* of the books had letters of 1.75 mill.; in seven only they measured 1.50, while in sixteen (that is in the majority) the size was 1.25 mill. The width of the interlinear space varied all the way from 2 to 3.75 mill., but in the majority it ranged between 2.25 and 2.75 mill.

Highly interesting is the examination of the magazines and papers for the young people. Ten periodicals were examined;

* In this connection let me call the attention also to the small Bibles commonly used by children in the Sunday schools. The letters of the text measure 0·75 millim., and the italics of the superscriptions of the chapters are still smaller. The space between the lines is one millim. wide, and the paper is of so much inferior quality that the print shows through the paper. It is the worst kind of book print I ever saw, and what I have said concerning the School Dictionary applies even with greater force to this kind of Bible. Further comment is unnecessary.

the paper was found good in four, fair in two and poor in four. The letters measured 1.75 in but one; 1.50 in three; 1.25 in five, and 1.00 in one. The interlinear space was 3.25 in only one paper, in all the rest it varied between 1.00 and 2.25 mill. There was but one paper among the eleven which attained the standard of good paper, proper size of type and proper leading. And the magazine whose letters dwindled down to 1 mill. (agate) and whose lines are separated only by 1 mill. space is one of the most popular, if not *the* most popular paper read by our girls and boys.

In reading this report we cannot fail to notice the great difference in quality of print between the school books on the one side, and the books and periodicals the children read at home. The superiority of the school books is worthy of special notice. For it has been a common practice to charge the schools and school books with being the principal causes for the development of myopia. Much stress has been laid upon the injurious effect of insufficient or faulty illumination of school-rooms; much has been written about unsuitable school desks and seats, and grand results were confidently expected from a reform of the school rooms. But the results were sadly disappointing. The statistics showed that in the best arranged schools the number of myopic children was not smaller, nay, sometimes was found even larger than in similar schools with inferior appointments. Like the man who sees the mote in his neighbor's eye, but not the beam in his own, we were quick in exposing the faulty hygiene of the school room, but have paid little or no attention to the great and glaring offenses which were daily committed against the same hygienic principles in our homes. When our children get near-sighted, the mischief is not done principally in the schools, but at home! Our school rooms are well lighted; our school desks and seats are

acknowledged, the world over, as models of simplicity and perfection; and the desks are placed in proper relation to the windows. And as my examinations of the school books show, they, too, stand the test admirably well; all (with one exception, which I have noted,) fulfill those requirements which we regard of paramount importance in a book for the use of children.

But now let us look to the homes! How many houses afford the children as well lighted rooms as their school room? The rooms of the rich are dimmed by curtains and shades, and the rooms of the poor are dark for want of large windows, or because they are situated in basements or narrow alleys. How many children have a suitable desk and chair at home? How many parents take care that their children do not read or write with the light falling on the book from the wrong side, or in the evening seated too far away from the gas light? And how many books the children read at home can compare typographically with their school books? As our statistics show, only seven out of twenty-three books, and only one out of ten periodicals! But if the prolonged application of the eyes of children is the chief cause of making eyes so disposed near-sighted, upon which books do our children fix their eyes more steadily, more attentively, and more uninterruptedly? On the school books which they are obliged to read, or on the story books which they read for pleasure? Which, consequently, are likely to do the more harm to their eyes, the bold letters of the Fourth Reader, or the blurred nonpareil of the "Arabian Nights;" the clear brevier type of "Shaw's History of English Literature," or the fascinating stories of the "Waverly Magazine" with its agate type?

When we look at a child deeply absorbed in a story book; when we see how the little face gradually approaches and

almost touches the page; and when we then think of the enormous muscular strain these young eyes have to endure, in order to read the miserable print, then we shall know better at whose door we have to lay the responsibility for the impaired eyesight of so many children. Let parents understand that the hygienic principles they are so anxious to see observed in the schools must just as strictly be enforced in their own house. Let them adopt the typographical standard of the school books for all the other books their children may read, and there will be no place for penny papers, dime libraries and all the rest of the so-called cheap literature. It is the dearest sort of reading matter people can buy for their children; it is a penny-wise-and-pound-foolish domestic policy; they are saving the pennies but wasting that which once lost no money in the world can restore--perfect eyesight.

181 Clark Street.

ARTICLE III.

SURGICAL TREATMENT OF ACUTE, CIRCUMSCRIBED, PULMONARY GANGRENE; *Second Successful Operation; by* PROFESSOR C. FENGER, M. D.

Among the excellent voluntary papers presented at the last meeting of the Illinois State Medical Society, was a contribution to the surgical treatment of acute pulmonary gangrene, by Prof. Christian Fenger, M. D., of Chicago. The paper deserves and will elicit general attention, both from its intrinsic merit and as indicative of progress in American surgery.

As advised at the present time, four operations for acute pulmonary gangrene have been performed.

The first operation was performed in 1879, by Messrs. Lawson and Cayley, of England, in a case of pulmonary gangrene of five weeks' standing. Decided amelioration of symptoms, more particularly as regards cough, dyspnœa and fetor, was observed. The patient died of exhaustion four days after the operation. The autopsy disclosed facts which led the operators to believe that an earlier operation would have saved the patient's life. (Med. Society, London, 1880.)

Mr. Solomon Charles Smith, of Halifax, performed the second operation in 1880. The patient was in the second week of croupous pneumonia, when gangrene occurred in the lower lobe of the left lung. The patient lived ten days, with marked improvement in cough, dyspnœa and fetor. No autopsy was made.

Professor Buhl, of Christiana, performed the third operation in 1880. Acute gangrene in the anterior portion of the left lung was the indication for operation. After a long convalescence of six weeks the patient recovered.

The fourth operation was performed by Professor Christian

Fenger, of Chicago, in the Cook County Hospital, in April, 1884.

The patient, male, 34 years old, was in the second week of croupous pneumonia. Signs of consolidation and formation of a cavity in the right infra-mammary region, extending into the right axilla, were elicited by auscultation and percussion. Cough was distressing and dyspnœa great; about one pint of extremely offensive sputa was daily expectorated. The patient lost all appetite and rapidly progressive emaciation supervened. A cavity was found, upon the introduction of the needle of a hypodermic syringe through the thoracic wall, in the right infra-mammary region. An incision was made parallel to the clavicle; the ribs exsected to an extent sufficient to secure access to the part, and the needle re-introduced within the cavity, as a guide. The cavity was then cut down upon by the small platinum pole of a Paquelin's thermo-cautery, and an opening sufficient to admit the index finger secured. Digital exploration revealed no detached gangrenous masses. Accordingly, the cavity was gently washed out, a drainage tube inserted, and the usual antiseptic dressing applied. Hemorrhage during the operation was trifling, but washing out the cavity produced very troublesome coughing. The patient speedily reacted from the shock of the the operation, which was relatively slight.

Five hours after the operation, appreciable diminution in fetor was noted; at the end of the first week, expectoration was minimal, and fetor could not be perceived; at the end of the second week, decided improvement with return of appetite was observed; the fourth week witnessed further progress; and at the end of the fifth week the patient was out of bed. During convalescence bits of gangrenous lung tissue were discharged through the external opening.

With reference to the *technique* of the operation, Dr. Fenger recommends:—

1. The incision ought to be made parallel to the ribs.

2. The ribs must be exsected to a degree sufficient to secure access to the part.

3. In conformity with the suggestion of Albert and Mosler, the needle of a hypodermic syringe should be used as a guide into the cavity, or diseased lung tissue, and the small platinum pole of Paquelin's thermo-cautery should be employed to effect the opening.

4. The cavity must be washed out if practicable. Due care must be exercised to prevent drowning, if the cavity connects with a bronchus. Irrigation of the cavity was productive of no untoward effect in Buhl's case, but was the cause of troublesome cough in Fenger's patient, and Mosler ascribes one death to poisoning from thymol irrigation.

Dr. Fenger is of the opinion that there is no immediate danger of death from the operation, and that it is indicated in cases of acute, circumscribed, pulmonary gangrene.

ARTICLE IV.

A CASE OF ANEURISM OF THE ABDOMINAL AORTA, WITH NOTES OF POST MORTEM EXAMINATION.

By MARK H. SEARS, M. D., *Leadville, Col.*

I was called some time since, to see, A. H., a native of Switzerland, thirty-seven years of age, and a resident of the United States for about ten years; occupation, a miner and its kindred pursuits; of phlegmatic temperament. He stated that about two years ago he first began to complain, but that his symptoms were obscure and uncertain. About eighteen months ago he began to have some pain in the umbilical region. At the same time, or soon after, he noticed some induration and a sensation of fullness, which had since gradually increased.

I found his pulse small and thready, about 100 per minute; temp., 100 F.; respiration about 25 per minute; skin dry and harsh; capillary circulation sluggish; bowels fairly active, and alvine discharges apparently normal; appetite capricious, evincing some desire for the animal broths; assimilation poor; mentality good, answering without hesitation questions addressed to him. Complained of some pain in the left lumbar region of a dull and heavy character. A few days before I saw him, he had complained of severe neuralgic pains in the course of the anterior crural nerve and its branches. These symptons had been relieved by morphiæ sulphas in suitable doses, and had ceased to recur when I visited him. These were the only symptoms of spinal origin which occurred in the history of the case.

The patient had also been "leaded" several times—this is the common expression for lead poisoning among the miners of this region. Upon examining the abdomen I found presenting in the lower portion of the left inguinal region, an

indistinctly fluctuating tumor of considerable firmness. It extended from midway of Poupart's ligament, to a point upon the linea alba two inches above the crest of the pubes.

There existed in it a distinct thrill with each ventricular contraction, that expanded the walls of the tumor equably with each pulsation. Pursuing the examination upward, I found in the upper portion of the left inguinal and lower portion of the left lumbar regions a hard, resisting, non-fluctuating body, situated subcutaneously. Subsequent information obtained post mortem, proved this to be the left kidney. Continuing the course of the tumor, which had again resumed its firm though fluctuating character, I traced it upward through the region last mentioned into the left hypochondriac region, where its outlines were partially lost beneath the floating ribs.

Throwing the patient upon his right side, there appeared upon the back of the left side a circumscribed enlargement of the size of a large orange. It commenced at a point about one and a half inches to the left of the tenth and eleventh dorsal vertebra, extending around the side anteriorly.

The integument covering it was injected, cyanosed, nearly devoid of sensation, and dotted at intervals with minute points of ulceration. The physical characteristics were the same as those presented by the tumor in the abdomen. They were better marked, however, as the tissues covering the enlargement were being absorbed rapidly and consequently its covering thin. Percussing it, the resulting note was heavy and dull, as though the tumor were solid. As the post mortem revealed one or two inches of semi-organized fibrin lining the cavity of the growth, it explains the non-appearance of a percussion note more tympanitic.

Auscultation gave greater satisfaction, and revealed the aneurismal "bruit," although somewhat indistinctly. The second

sound of the heart was well defined in the tumor. The cavity of the chest presented the physical symptoms of hydrothorax of left pleura; while in the right lung the normal vesicular murmur and resonance existed only in the lower portions. Heart's action was weak and uncertain, apex pushed forward and to the left, impulse in fifth intercostal space, area of præcordia diminished in size.

From this association of symptoms I diagnosticated "Aneurism of the Abdominal Aorta."

The patient died May 12th, 1884, probably from exhaustion, there being no rupture of the aneurismal cyst.

Post mortem examination three hours after death.

Body greatly emaciated, of about 100 lbs. weight, some icterus.

Same tumefactions as had existed in life present; but now, instead of being firm and unyielding, they are soft and compressible.

First line of incision passed from pubes to top of sternum, intersected by the usual crucial incision in abdomen. Flaps reflected back, Stomach of normal size, shape, etc. Position entirely changed. The greater curvature lay immediately in contact with the abdominal parietes, the lesser curvature toward the vertebral column, and embracing the renal vessels of the left kidney, whose position will be described presently. The cardiac and pyloric orifices, which were respectively superior and inferior, were on nearly a direct plane.

At the left of the stomach, covered by the abdominal muscles, great omentum, and partially in the inguinal and lumbar regions, as previously mentioned, lay the left kidney. It was enclosed in a capsule of adventitious tissue—possibly the elements of the normal fibrous capsule pathologically enlarged and added to by the results of a very low chronic inflammation,

whose results were everywhere apparent in the great number of adhesions.

After carefully removing this capsule, the kidney and renal vessels were exposed. The latter were elongated and passed beneath the lesser curvature of the stomach to their respective origins. Removing the kidney and cutting into it, both the cortical substance and medullary portion were found infiltrated with fat—fatty degeneration.

Liver, healthy, but rather small for a person the size of the subject.

Spleen, normal, but somewhat flattened between the walls of the abdomen and the walls of a large tumor which now presented. The small intestines had been forced into the cavity of the pelvis and right side of the abdomen.

The tumor, which was ten inches long, lay with its base pressing upon the external iliac artery, while its large bulbous apex pressed into the posterior hypochondriac region on the left side and formed the large protuberance externally on the back.

It embraced both sides of the bodies of the four upper lumbar vertebræ with their transverse processes, and the bodies of the eleventh and twelfth dorsal vertebræ. So firm were the adhesions that it was not practicable to remove it in its entirety. In this event I deemed it best to evacuate the contents if possible. I made an incision into it, and after passing through one and one-half inches of organized fibrinous material lining the sac, I reached a cavity, and verified the diagnosis of aneurism which had been made

The contents of the cavity were clotted blood, which with the fibrinous material was removed. The opening into the aorta was one and one-half inches below the cœliac axis, was three-quarters of an inch wide, and one and one-quarter inches

long. The wall which had existed between the aneurismal cavity and spine had been absorbed, so that the bodies of the vertebra were exposed to the direct action of the blood and pressure of the aneurism. Never were the effects of continued pressure better exemplified. The transverse processes of the first, second, and third lumbar vertebræ were completely destroyed on both sides; those of the fourth lumbar, partially; also the bodies of the several vertebræ mentioned, together with those of the eleventh and twelfth dorsal, to nearly their center, and in one instance an opening into the spinal canal. It is worthy of remark that there was no evidence of functional derangement of the spinal cord in life other than that of the crural neuralgia mentioned in the first part of this article. The lesion would seem severe enough to have interfered with the integrity of the spinal canal, and produced pressure upon the cord with its obvious results.

The sac with its contents having been carefully removed, was found to weigh 6½ lbs. av.

There was no rupture in its walls, which were one-quarter of an inch thick.

The examination of the heart revealed fatty degeneration. The left lung was collapsed and bound down by old pleuritic adhesions; while the pleural cavity contained about three pints of serum—much of it post mortem, I presume. The upper lobe of the right lung was consolidated and contained a small abscess.

In conclusion. There was neither history nor evidence of syphilitic taint, none of violence. The disease occurred in the person of a strong middle-aged man, whose only ailment previous to this fatal disease, had been several attacks of acute lead poisoning, which probably had saturated his system. In the absence, then, of evidence to the contrary, I shall ascribe his aneurism to chronic lead poisoning.

ARTICLE V.

INJECTIONS OF GLYCERINE AND CARBOLIC ACID FOR THE PRESERVATION OF BODIES FOR DISSECTION. O. T. FREER, *M. D.*, *Munich.*

During a course of dissection in the anatomical department of the University of Munich, I observed that the material showed a remarkable resistance to decay, being still fresh at a period when the average subject of Chicago's dissecting rooms is too much decomposed for use. The parts which I was dissecting were in almost as perfect a condition after exposure to the air of a warm room for from two to four weeks, as when they were first given me; and those portions from which the skin had not been removed remained entirely unchanged.

On inquiry I learned from Professor Rudinger, Munich's anatomist, a man who has written numerous valuable works and done much for science by his original researches, that he preserved his subjects by injecting into the femoral artery a mixture of glycerine, carbolic acid, and alcohol, a method invented by himself and used here since 1872.

Since its introduction he had seen no bad effects from dissection wounds here.

He said that, according to the amount of injection-material used, subjects would keep from two to six months in a summer-temperature, the only necessity being moisture to prevent mummification.

The solutions used by Professor Rudinger are:

(*a*) For preserving bodies for long periods, three to six months: Glycerine, 40 parts; carbolic acid, crystalized, 11; alcohol, 8.

(*b*) For preserving bodies from two to three months: Glycerine, 80 parts; carbolic acid, 17; alcohol, 13.

The amount injected varies according to the length of time it is desired to preserve the subject, from two to four liters being ordinarily used; but an average body will readily contain six and more.

The advantages of this method are, that the tissues preserve their natural appearance and pliancy from the commencement of an ordinary dissection to the end. Students, therefore, need not hurry their dissection, even in warm weather, as decomposition is so slow that the parts dissected last are in as perfect a state as those seen first. The solutions mentioned above do not whiten the tissues, which retain their natural appearance to the end.

ARTICLE VI.

SURGICAL DELUSIONS. *An Abstract of the Address in Surgery of the Medical Society of the State of Pennsylvania for 1884, by* JOHN B. ROBERTS, M. D., *Professor of Anatomy and Surgery in the Philadelphia Polyclinic.*

Many surgical theories and procedures have become traditional, and are accepted as true and correct merely because reverence for antiquity or careless acceptance has not questioned their right to be classed as surgical facts. The present age is an incredulous one, and demands accurate investigation of all such claims. The field of investigation is large, for progress has been retarded by the influence of theorizing writers with monochromatic vision, the example of non-seeing and non-looking devotees of the fetiches of surgical superstition, and the convincing effect of a repetition of false statements. I shall select a few topics which have greatly interested me, and concerning which I probably differ quite widely from many of you.

CHLOROFORM ANÆSTHESIA.—Many still cling to the delusion that chloroform is a safe anæsthetic, because they have never seen a patient die from it. Is one man's experience to weigh against the physiological, the experimental, the clinical experience of the whole world? Dare we employ chloroform instead of ether, when recognized authorities state that in chloroform anæsthesia death occurs without warning in the hands of experienced administrators? when some five hundred deaths have already been reported? when Schiff and Dalton reject it in physiological laboratories because of its mortality? when the Scientific Grants Committee of the British Medical Association assert that chloroform is a more dangerous anæsthetic than ether?

Adherence to chloroform in the face of such facts is criminal when circumstances permit ether to be obtained. The assertion that it is often impossible to produce anæsthesia with ether is the result of inefficient methods of administration. Ether, if given as chloroform is and should be given, is in truth a useless anæsthetic, but given properly, it is efficient.

VALUE OF STYPTICS.—The belief in the necessity of styptics is a delusion less dangerous than that just mentioned, but is given more extended credence. Such agents are seldom, probably never, needed in general surgery to arrest hemorrhage. When ligatures, torsion or acupressure is not demanded (and such is seldom the case unless the artery is as large as the facial), moderate direct pressure applied in dressing the wound is the only hemostatic required. Styptics often do harm, and as they are not needed, they should be discarded.

FATALITY OF SMALL HEMORRHAGES.—There is much apprehension about the quantity of blood that a healthy man can lose with impunity. Many who often look with equanimity upon a parturient woman losing a pint of blood from the uterine sinuses would be dismayed at a man losing half or quarter that amount during removal of a tumor. While not advocating useless waste of blood, and especially in patients suffering surgical shock, I assert that there is an unnecessary fear of blood spurting from a few insignificant vessels. The largest artery can be controlled by pressure not greater than is used for ringing the electric bell in your hotel. Hence, there is always sufficient power in your fingers to obviate fatal hemorrhage until strings can be obtained and applied.

DANGER OF TREPHINING THE SKULL.—The dislike to make exploratory incisions in closed fractures of the skull, evinced

by some surgeons, and the objection of others to trephining, and thus opening the diploic structure in open fractures, are delusions of a most disastrous tendency. To wait until symptoms of cerebral compression or inflammation have supervened is to lose the most favorable opportunity for mechanical relief. Such a Fabian policy is often followed by death. The treatment of open and of closed fractures of the skull should not be looked upon as very different, since with the present improved methods of dressing wounds the successful issue depends almost entirely upon the cerebral rather than the cranial phase of the injury. If such fractures as we usually see in the skull were not in proximity to the brain the surgeon would consider them almost trivial. The feature of closed fractures that renders them so troublesome is the obscurity that accompanies them. I have for a number of years strongly advocated making closed fractures open ones by means of an exploratory incision whenever there is a suspicion of the existence of depression or splintering. In open fractures, operation to elevate depressed portions and get rid of splinters of the inner table thrust into the membranes, should be undertaken rather than avoided. It is better to err on the side of action than that of inaction. Careful manipulation and proper dressings at an early stage are sources of less risk than is incurred by the surgeon who leaves, unseen and unsuspected, fragments thrust into the membranes or brain.

OPERATIVE DELAY IN STRANGULATED HERNIA.—A similar delusion of fatal issue is that leading to postponement of operative interference in strangulated hernia. Repeated attempts at forcible taxis and medical pow-wow-ing with temporizing measures, have ended more lives than the use of the knife. Herni-

otomy done within twelve hours is almost always followed by recovery. Death is to be expected, however, if strangulation has existed for two or three days, and the gut has been bruised by violent manipulation in the endeavor to relieve the constriction by taxis. Moderate taxis under ether, a half-day's treatment with cold applications and the internal use of morphia, and a second moderate attempt at taxis followed, if unsuccessful, by immediate operation, is the sequence to be followed in strangulated hernia. When symptoms of strangulated hernia exist, the slightest fullness and tenderness in one groin over either of the rings, is a sufficient localizing indication to warrant operation.

OPERATIVE DELAY IN ACUTE PHLEGMONOUS INFLAMMATION.—No insane delusion, no Spanish Inquisitor, ever caused so many hours of excruciating physical torture as the hallucination that acute abscesses and furuncles must not be incised until pointing has occurred. All the world knows that evacuation of imprisoned pus in phlegmonous inflammations means instant relief of the agonizing pain, yet how few of the profession early and freely incise such inflamed tissues unless they first see the yellow pus under the thinned skin or feel the fluctuation of the fluid in the abscess cavity. The pain is causd by the effort of the pus and sloughing tissue to escape. Is it not, then, more rational to make a free incision to-day than to wait till next week? Time and pain are both saved by early incision. If the cut is made before the pus has actually formed, so much the better. Probably no form of abscess needs early and free incision more imperatively than that under the palmar fascia. Destructive burrowing of pus is prevented by this radical procedure, which also saves the patient many days of poultices and purgatory.

OPERATIVE DELAY IN MALIGNANT TUMORS.—Much bad surgery results from a delusive postponement of operative interference in malignant diseases. Instant removal is to be practiced in such cases, provided the patient is deemed fit to stand the surgical shock.

NECESSARY FATALITY OF TRAUMATIC TETANUS.—That traumatic tetanus is of necessity fatal, is a commonly held opinion. Proper treatment is sometimes neglected because of this belief in its hopelessness. That the prognosis is extremely unfavorable, I admit; but that cases of a severe type recover, is undoubted. Chloral hydrate, in full doses, has given the best results. But I do not propose speaking of therapeutics at this time. I merely wish to impress upon the profession the fact that a fair number of cases of traumatic tetanus recover.

FATALITY OF PERICARDIAL AND CARDIAC WOUNDS.—The prevalent notion of the excessive danger of these wounds is delusional, at least in as far as it teaches that these structures will not brook surgical interference. The pericardial sac should be dealt with exactly as the pleural sac—by aspiration, incision, irrigation and drainage according to the lesion. That simple puncture or aspiration of the heart itself is not accompanied by the expected risk to life, has been pretty well shown, though I am not prepared to recommend its general adoption for trivial cardiac conditions.

SYMMETRY OF NORMAL LIMBS.—Another delusion, still existing in many minds, is that the lower extremities are usually of the same length. Clinical and anatomical investigation show that asymmetry in the length of normal limbs is of common occurrence. Therefore, measurements of the legs in cases

of fracture are of little value, since it is impossible to know whether it is the femur of a long or a short leg that is the seat of injury.

USELESSNESS OF TREATING VICIOUS UNION OF FRACTURES.—It is a fact, not sufficiently appreciated, that many cases of deformity from imperfectly treated fractures of long bones, can be remedied by refracture. Over and over again have I seen cases of grave disability and deformity cured by the application of sufficient force to break the callus uniting the misplaced fragments. Five or six months is not too late to resort to this expedient for correcting what otherwise must be a life-long evidence of defective surgical attendance.

There are many other prevalent surgical delusions, such as that bony union of transverse fractures of the patella, and of intracapsular fractures of the femoral bone cannot take place; that chronic purulent discharges from the ear do not need active treatment; that hypermetropia and hypermetropic astigmatism can be properly estimated and corrected without paralyzing the accommodation; that it is improper to perforate the nasal septum in cases of great deviation; that crooked noses are not amenable to treatment; that corneal operations and cataract extractions should be treated by cotton padding and bandages to the eyes; that fractures should be treated with carved or manufactured splints.

While an earnest advocate of conservative and of reparative surgery, I believe that, when operative surgery is demanded, it should be aggressive. Delay, indecision, and inefficiency impair the value of much surgical work, and are often the legitimate result of a superstitious faith in delusive surgical dogmas.

In Memoriam

WITHIN THIS URN LIE THE ASHES OF

SAMUEL DAVID GROSS

A Master in Surgery

His life, which neared the extreme Limits of the Psalmist,
was one unbroken process of Laborious Years.
He filled Chairs in Four Medical Colleges in as many States of the Union,
and added Luster to them all.
He recast Surgical Science as taught in North America,
Formulated anew its Principles,
Enlarged its Domain,
Added to its Art, and imparted fresh Impetus to its Study.
He composed many Books, and among them

A System of Surgery

Which is read in different tongues, wherever the Healing Art is practiced.
With a Great Intellect, carefully trained and balanced,
He aimed with undivided Zeal
At the Noble End of Lessening Human Suffering
and Lengthening Human Life,
And so rose to the Highest Position yet attained in Science
by any of His Countrymen.
Resolute in Truth, he had no Fear, yet he was
both Tolerant and Charitable.
Living in Enlightened Fellowship with all Laborers in the
World of Science,
He was greatly Honored by the Learned in Foreign Lands
and deeply Loved at Home.

BEHIND THE VEIL OF THIS LIFE THERE IS A MYSTERY WHICH HE PENETRATED ON THE

Sixth Day of May, 1884

HIS MEMORY

Shall Exhort, and his Example shall Encourage and Persuade
those who come after him to Emulate Deeds
which, Great in themselves,
Were all Crowned by the Milkwhite Flower of a

Stainless Life

EDITORIAL.

MORE ABOUT PUBLIC LAUNDRIES.—There is a melancholy species of poor satisfaction to be derived from the contemplation of the woes of a neighbor whose sufferings have been profoundly experienced in our own person. This frank admission of the lower instincts of a depraved human nature, is suggested by glancing over the published report of the late General Medical Council of Great Britain. In one point, and in one point only, does this report suggest the transactions of some of our State Boards of Health. The sole point of resemblance is the opportunity, which is here improved, to do the washing of some soiled linen in public. If it is painful for us who live in the State of Illinois to have the mass of British practitioners understand that the professional men of the Northwest do not know how to spell, it may be scarcely less disagreeable to English gentlemen to have the inhabitants of the settlements in the wild west impressed with the conviction that the average British practitioner is a person capable of setting fire to property, of personating other individuals, or of being guilty of other crimes for which the penalty of the law has been inflicted behind the bars of a government penitentiary.

For it is a melancholy fact that in the report of the Council to which we refer, one Sadgrove had his name removed from the Register "on account of having pretended to have qualifications which he did not possess." (How many names, alas,

would disappear from the roster of great men in science, if this rule were successfully and rigidly enforced in all cases!)

At the same meeting, one Story was refused restoration to the Register because, in the year 1881, he had been convicted of arson for which he had suffered two years imprisonment. Again, one Smith (and even this not unfamiliar name persuades us that in many respects, indeed, the practitioners on the other side of the Atlantic are truly our brethren after the flesh, with a tendency for the same imposthumes to develop upon their otherwise vigorous bodies!) who had lost registration in 1873 on account of "infamous conduct," was restored by the Council at this same meeting on the petition of a large number of medical practitioners. A curious case was presented in the person of one O'Hare, who had personated a registered practitioner named O'Hara. O'Hare, it seems, had suffered erasure from the Register in 1878, on account of "felony;" while the man whose name he had assumed had also been dropped from the Register in consequence of failure to reply to certain letters which had been addressed to him. One Murray also suffered erasure from the Dentists' Register on account of "infamous conduct."

From certain recommendations, made by the committee also the idea is conveyed that at the examination of candidates for license to practice, some who were capable of successfully passing the examination had been guilty of "personating" those who were not capable of undergoing the ordeal, thus securing the license for the latter. We sincerely hope that the announcement of this fact in this public manner will not stimulate Yankee ingenuity to the perpetration of a still more refined method of outwitting law.

We beg leave to assure our British brethren, with sincerity and a due degree of emphasis, that while on this side of the

Atlantic we do not all know how to spell, there is, in the language of their countryman, Mr. Matthew Arnold, "a remnant" of us who do. Though we understand from the report of their General Medical Council that there are British practitioners in the United Kingdom who have been guilty of "arson," "infamous conduct," "felony," "personation," and divers other eccentricities, some of which have been punished by imprisonment, we are firmly convinced, and we say it without fear of contradiction, that there is "a remnant" of British practitioners who have not been guilty in these particulars.

Critics more invidious and less magnanimous than they should be, might be tempted here to make some odious comparisons. But we shrink with aversion from such a course. Let it be ours rather to cover with a mantle of charity these shortcomings of our British neighbors, and to admit frankly that we too have sinners on this side of the water. Let it be ours to urge that they take warning from our example, lest a worse state of affairs overcome them. DeQuincey first characterized the man who began by committing murder, and concluded by becoming the worst of confirmed procrastinators. If the British Register be not thoroughly purged, the dreadful consequence may be, that the men who have set an example to others by the commission of the crimes named above, may be followed by others who actually misspell their mother tongue!

ANATOMICAL BILL.

The bill to amend the present law regarding the disposition of unclaimed dead, framed by the Demonstrators' Association of Chicago, lies before us. A letter from the Secretary of the Association, Dr. A. B. Strong, 533 West Monroe street, Chicago, with a copy of the bill, has been sent to all physicians in the State, soliciting their aid, and requesting them to interview in

person the members of the next Legislature, and secure as many friends for the bill as possible. Thus far, replies have been received from over 300 physicians, promising their active support.

If the members of the profession in this State will interest themselves in this matter there can be no doubt of the adoption of the amendment next winter. The failure in the original bill, which placed it in the power of a few local politicians to defeat the will of the people and the evident intention of the General Assembly, should be remedied at once. The following are a few extracts from the Secretary's stirring letter:

"The existing law has been satisfactory in its working until the last year; fulfilling in every particular the intention of the law; that is, preventing the desecration of cemeteries and benefitting alike medical students, physicians, and the general public by furnishing the colleges a plentiful supply of material from the unclaimed pauper dead. The existing law is weak and deficient in the following particular: It is not mandatory—says *may* instead of *shall* when designating what bodies may be delivered to medical colleges; thus giving designing persons an opportunity to interfere with the intention of the law. * * * The only remedy is additional legislation. The accompanying draft of a bill amends the present law by, first, making it mandatory, and thus prevents any interference with its proper intentions, by a political clique, or other meddling persons. Second, giving preceptors as well as teachers in medical colleges the right to claim material for medical and surgical uses. Now, Doctor, knowing, as you do, the necessity for dissection and experimental operation, may we not rely on you to give what personal aid is in your power to advance the cause of medical education in and out of college, by making it a matter of personal interest; to call upon the members of your district and urge them to support the measure for the following reasons among others:

"First: The dissection of human bodies is absolutely necessary for the proper education of the physician.

"Second: Such being the case, the colleges must and will have human bodies.

"Third: There are bodies enough of those unclaimed and unknown persons who die in the institutions supported by public tax, to meet the demands of the colleges.

"Fourth: Consequently, the law is a protection to private cemeteries; for since the passage of the present law until this winter, public morals and decency have not been once outraged by the fiendish acts of the resurrectionist. Will you please advise me of the names and addresses of legislators whom you may see, with their opinions of the bill, that we may have some idea of the number of its friends in the next Legislature."

Every physician in this State, every one interested in the welfare of our profession and a higher and better medical education should give this bill his hearty support. Show the general public and politicians that doctors, though they differ at times, are a unit in what concerns the welfare and ultimate good of the profession.

We hope that every one of our readers residing in the State of Illinois will coöperate with Dr. Strong in his efforts to put this amendment on our statute books.

We call the attention of our readers to the list of Boylston prize questions, for 1885–86, among the advertisements. It is to be hoped that some of our readers in the West will gain one of these prizes, so rich in professional honors and pecuniary rewards.

DOMESTIC CORRESPONDENCE.

LETTER FROM BOSTON. *Death of Professor Ellis—Resignations at the Massachusetts General Hospital—Boston's New Sewerage System—Annual Meeting of the Massachusetts Medical Society—Posterior Plaster Splint—The Admission of Women.*

BOSTON, June 24, 1884.

You know that medical men are very fond of professional gossip, and had you lived in Boston for the last few months your appetite for medical small talk would have been satiated. What with changes in the Medical School and resignations at the Massachusetts General Hospital, we have been indeed amused. The first change was the irreparable loss by death to the Medical School, of Professor Calvin Ellis, who had for many years filled the Jackson chair of clinical medicine. Dr. Ellis' memory has been honored by a stated meeting of the District Society, and the encomiums there offered were eloquent and justly deserved. A man of simple habits, upright conduct in all the paths of life, a careful instructor, a trusted family counselor, and a highly valued consultant. He left a competency, the greater part of which goes to the Harvard Medical School. A worthy successor has been selected in the person of Dr. Robert T. Edes, the Professor of Therapeutics, who has been transferred to the chair of clinical medicine.

An unpleasant state of affairs has arisen at the Massachusetts General Hospital, where the two senior surgeons, Drs. Bigelow and Hodges, have tendered their resignations to the Board of

Trustees, owing, it is said, to the refusal of the Board to appoint as house pupil the candidate nominated by the majority of the staff. For years a feeling has existed that appointments at that institution in many cases were the result of favoritism, and the acceptance by the Board, of a minority report has been the "casus belli." It is thought that the gentlemen will remain, as the Trustees have already asked them to withdraw their resignations. Their loss to any hospital would be a great one, but especially is it to be regretted that men occupying the position they do in the profession should become involved in an almost personal quarrel, and feel it incumbent to resign in a huff. In justice to the gentlemen, let me say that it is generally conceded that they were right in the issue taken, but the principle of tendering resignations where one cannot have one's own way is wrong; and we retrospect upon our juvenile days when a cross in our play led us to exclaim, "I won't play!"

Our new system of sewerage which has been put in operation this year is working very satisfactorily; the city now has a system of sewerage second to none in the world, and which has been constructed at an expense of between five and six millions of dollars. The work was begun seven years ago, with the object of intercepting the sewage of the city as it flows in the existing sewers and conveying it to a point where it may be discharged with safety to the public health. The intercepting sewers follow the marginal streets of the city as far as practicable, that the sewage may be intercepted near the outlets of the old sewers. The new system allows the sewage to flow at all times, regardless of the condition of tide or weather. The entire sewage of the city is collected in a large reservoir covering several acres at Moon Island. This reservoir will be emptied twice in twenty-four hours, it being so situated that the ebb tidal current will sweep the sewage far out to sea.

The system was designed by a commission appointed by the city government in 1875, consisting of Mr. E. S. Chesborough, City Engineer of Chicago; Mr. Moses Lane, City Engineer of Milwaukee, and Dr. C. F. Folsom, Secretary of the Massachusetts State Board of Health.

The one hundred and third meeting of the Massachusetts Medical Society was held in Boston on June 10th and 11th. The morning of the 10th was spent in visits by the members to the various hospitals. At noon the society assembled at the new Harvard Medical School to witness experiments and a demonstration of "Modern Methods of Research in Physiology," by Professor H. P. Bowditch. The laboratories were shown, where experiments were in progress under the direction of Professor Bowditch's assistants. Following these demonstrations, Dr. Thomas Dwight, the new Professor of Anatomy, who has been very successful in his teaching the past season, then addressed the society on "Modern Methods in Anatomy," showing superb frozen sections and anatomical preparations prepared by corrosion and by the use of Wood's fusible metal.

In the afternoon Dr. George W. Gay gave a demonstration of the application of the plaster posterior splint in the treatment of fractures of the leg. This method is largely used in Boston, and I can heartily commend it. The advantages of the splint are, its applicability to all fractures of the leg. Possibly certain Pott's fractures, where there is marked lateral displacement, should be excepted. It is an adaptable shell of plaster of Paris which is made for each individual fracture. It can always be readily opened—in fact, is always open—so that the limb can be under constant supervision; hence there may be no fear from sloughing or gangrene, the result of unrelieved pressure. It holds the fragments firmly in position, and the fracture remains "put." It can be easily removed and reap-

plied without impairing its integrity. The fractured limb having been wrapped in sheet wadding, a piece of crinoline long enough to extend from the toes to above the knee and wide enough to encircle the limb, is laid beneath the limb and closely wrapped around it, with the exception of a space an inch wide on its anterior aspect. This serves as a pattern from which to cut eight or ten similar pieces. These are slashed from their edge inward, especially at the heel, to allow their adaptation to the limb. The outer layer of gauze, which is larger than the rest, is folded over on the inner layer, thus binding the several layers of gauze and plaster together into a common whole. A plaster paste is then made, which is interlaid between the various pieces of foundation gauze. The splint is now adjusted to the limb, a roller bandage is applied over this, and the splint is complete. In a few hours the outer bandage may be removed, the wadding cut up and buckled straps applied to keep up the desired compression.

At the conclusion of this paper the society was called to order by President Hosmer. After a rather stormy discussion and a lamentable display of ignorance of parliamentary law by both President and Fellows, by-law I. was amended to read as follows: "Candidates for admission into the Massachusetts Medical Society may be either *male* or *female*, and every candidate must by proper credentials and examinations satisfy the censors of said society that he possesses the following qualifications, etc." Thus the question of the admission of women to the Massachusetts Medical Society is settled. At the meeting of the society three hundred and thirty-two members out of fifteen hundred and twenty-nine were present, of whom two hundred and nine voted to admit women and one hundred and twenty-three against their admission. At the Councilors' meeting, of one hundred and ten present out of one hundred and

seventy-two Councilors sixty-three voted in favor of admission of women and forty-seven against it. The action of the society places it on a more favorable footing with the laity, whatever the judiciousness of the movement may be. Accepting that a certain number of well-educated women will practice medicine, that the State in chartering the Massachusetts Medical Society intended it to act as a licensing body, and that a widespread public opinion demanded their admission, the Censors of the society could not long have refused to consider a female's qualifications for admission to the Massachusetts Medical Society. The annual dinner passed off with unusual brightness under Dr. George B. Shattuck, who acted as anniversary chairman. Dr. Charles D. Homans, the President-elect, suggested that the present scene of the anniversary banquet might, with the advent of women into our ranks, be changed in twenty or thirty years to a ball-room. Let me say, however, that the general impression is that there will be hardly a "baker's dozen" who desire to enter the Massachusetts Medical Society.

B.

SOCIETY PROCEEDINGS.

CHICAGO MEDICAL SOCIETY.

PUERPERAL FEVER—FRACTURES—THE GREATER TUBEROSITY OF THE HUMERUS, EXTENDING INTO THE BICIPITAL GROOVE.

A regular meeting of this Society was held on the evening of May 5th, 1884, when papers upon the above topics were read. The first, on "Puerperal Septicæmia and Prophylaxis of Puerperal Inflammations," was ably presented by Dr. G. F. Lydston, wherein he differed from a number of eminent writers on these subjects. The paper is some seventy odd pages in length, written on legal cap, and consumed the greater part of the evening's session. Below will be found a somewhat brief extract, for to dwell upon the merits of this lengthy article in detail would require more space than we can in this issue devote to it.

After reviewing with some vigor the discussion of "Puerperal Fever" that has appeared during the winter in an Eastern journal, and that of the New York County Medical Society, as well as the admirable essays upon the subject by Drs. Thomas and Garrigues, the writer asks, What is puerperal fever? To define this, he added, is a most difficult problem. Referring to the descriptions of Leishman, Hervieux and Lusk, how widely different are their definitions, described at intervals extending over a period of ten years. Barker states that puerperal fever is an entity. This definition, of course, is stripped of its superfluous and obscuring elements, all of which is denied by Lydston; and whether "septic" or "specific" puerperal infec-

ion "be the assumed common cause in puerperal fever (*i. e.*, transposing his ideas), to assume that diseases which may occur from numerous and most diverse causes in the non-puerperal female should change and become suddenly specific" is illogical. To enumerate them all and their multiplicity would be an act of supererogation in this condensed report, nor shall we attempt doing so at this time.

The writer did not, however, wish to be understood as advancing any arguments in favor of ignoring the danger of septicæmia, but simply of offering a protest against what he was pleased to term the "septophobia" prevalent in some quarters. In other words, he defined his position as midway between the two extremes of practice. Through the medium of the placenta there is a constant interchange of nutritive and waste materials between the vascular systems of the mother and child. The former is far in excess of the latter, and is a physiological necessity. In this process of osmosis the fluids are chiefly towards the child. At birth, however, all this is changed, and the osmosis is in the direction towards the maternal circulation. The afferent current is checked, and the lymphatics and veins of the mother are more active than ever, as it is mainly through them that the retrograde metamorphosis of tissue occurs, which is the essence of physiological uterine involution; or, as is described later in the paper, the function of the lymphatics and veins of the puerperal woman is to remove those nutritive materials which by the removal of the fœtus have been rendered unnecessary. That a large amount of waste material is thus removed is evidenced by the peculiar character of the colostrum. This, rather than the patulous condition of the uterine sinuses, is the most important physiological circumstance favoring septic absorption, for with the products of retrograde metamorphosis of tissue we are likely

to have absorbed the products of putrefactive changes. The so called "milk fever" may also be ascribed to this cause. It is not necessarily injurious, as experienced obstetricians have lately stated; and *Lusk* states that round micrococci are the necessary casual element of true septic fever. This, if it be true, agrees very well with the views just advanced. Lydston's belief is that milk fever is simply due to hyper-activity of the nutritive functions, resulting from the sudden introduction of an excessive amount of nutritive material into the circulation. It will be observed that the fever lasts only until the excess of material has had time for elimination, chiefly through the selective action of the mammary glands. Of course, it must be admitted that if products of putrefaction be also introduced, the rise of temperature and danger of eventuation in septicæmia will be proportionately increased. * * * Pale, weak, anæmic women are most liable to develop septicæmia, while more robust women if sick at all, are most likely to be attacked by some variety of local inflammation. Yet should the latter have the clinical characteristics of a typical case of the disease, the origo mali in the first case cannot be the same as that of the second, and the two forms will depend upon widely different causes, in spite of the theory of the common cause, "septic absorption." Hypothetical typical cases of "puerperal fever," "local inflammations," with moderate and quite intense fever, etc., were clearly illustrated and graphically described in a few succeeding pages of the paper; where one woman that has passed through labor is a victim to toxic infection, whilst the other, who is plethoric, is markedly predisposed to inflammation; the one, whose tissues do not want an abundance of nutritive pabulum; the other, whose tissues fairly crave supplies of new material, and who, practically speaking, is a huge sponge, ready for the absorption of any

materials of an organic nature. These conditions of debility favor unhealthy and putrescible secretions.

The writer was inclined to believe that septicæmia may occur from the absorption of fluid from which bacteria are absent; sepsin in its results differs not at all from snake virus, and its destructiveness depends in a great measure upon local and constitutional conditions in the affected individual. In "pyemia," however, which is but one grade of "septicæmia," bacteria must necessarily be present. In certain cases of mild febrile attacks following child-birth, it may be simply a traumatic fever. This, while often due to septic absorption, may also be due to nervous influences, or traumatic fever resulting from nutritive disturbances (as shock), which is due to excessive reaction following nervous depression. Shock also may be due to the use of instruments. Malarial fever may also come on in the puerperal state. Certainly, then, septic infection may not be present in any of these instances, and yet the case be diagnosed as septicæmia. In certain cases of septic infection following labor, we have diffuse suppurating abscesses, differing little, if any, from "pyemia" that may follow surgical operations; but the characteristic temperature curve is exceptional in the former, which is present in "pyæmic" fever. This form of puerperal septicæmia is sometimes very chronic, resulting in gluteal abscesses; and even secondary suppurative processes have been found (by himself) at the autopsy in the liver and kidneys. The causal element of the phases of the diseases usually termed respectively pyæmia and septicæmia, is the same, but the former is a misnomer. In one we have the formation of thrombi, which contain micrococci, and which, becoming detached, enter the circulation until they lodge and form new foci for suppuration, etc., while in the other no thrombi are formed, or if formed become so rapidly and tho-

roughly disintegrated that secondary suppurations do not result. Comparative illustrations were then given why metastatic abscesses cannot result from dissecting a wound which is septicæmic. In a general way, the formation or non-formation of thrombi depends upon the intensity of the infection and the local and constitutional conditions present. Metastatic abscesses are quite exceptionally seen in the puerperal state. This may be due, in part at least, to the fact that the patients are so speedily destroyed by the intense infection characteristic of puerperal septicæmia. Thomas goes to the extreme of attributing all puerperal disorders to the absorption of septic poison; and, in further quoting that author, according to the writer, it matters not whether the disease be a phlebitis, cellulitis, lymphangitis, or peritonitis, the essence of the disorder is the absorp- of poison into the blood of the puerperal woman through some solution of continuity in the genital tract. * * * How about exposure as a cause? Phlebitis following labor may give rise to the disease known as phlegmasia dolens, and may result from trauma, especially if exposure be superadded; or it may arise from simple thrombosis, occcuring independently of bacteria or septic processes, in the same manner as cellulitis may arise. * * * A "locus minoris resistentiæ" may be afforded; and the woman being especially susceptible to cold and depressing influences of all kinds, it remains but for an exposure to a draught of air to light up an inflammation of the uterus, constituting a metritis, or a pelvi-peritonitis, or cellulitis. The simple passage of a sound into the non-pregnant uterus has been known to produce pelvic inflammation, severe cellulitis, etc. A rapidly fatal general peritonitis has also been caused in the puerperal woman by simple extension from the pelvic peritoneum. In these cases, if septicæmia occur at all, it is secondary to or a complication of the inflammatory

affection. Considerable space was allotted in the paper to illustrate the probably fallacious reasoning of those who affirm that septicæmia is the term including the "many synonyms" of disease to which the puerperal woman is liable, when Parry's classification of these disorders was given, the principal feature of which consists in fever, with its various concomitants. Now, as this is also somewhat dogmatic and arbitrary in its division, yet it is often sufficiently practicable to enable us to recognize the existence in different cases of the affections named. Lydston, however, suggested a modification of Parry's classification which he thinks will enhance its accuracy. Regarding his suggestions, we will mention that only two should be classed "specific," and pyemia should be omitted altogether.

Before closing the review of this portion of the article, we wish to state again that Dr. Lydston does not deny that puerperal peritonitis is undoubtedly often septic in origin; but he emphatically insists that it is not always so, and that there is not a characteristic "septic peritonitis." * * * Regarding the conversion of the poison of the exanthemata into a "specific puerperal poison," the writer states it is absolutely impossible, for the reasons explained in the paper. The "unity" of the "materies morbi," the apparent interdependence of the poisons of different diseases, were to some extent forcibly impressed by the writer's citation of numerous cases and the variations dependent upon sanitary surroundings, etc. Considerable space was devoted to the diphtheria of puerperal wounds and puerperal erysipelas. The former, happily, is not of very great frequency, and it has the possibility, or a strong probability, of parasitic origin along the genital tract. The latter disease, however, may be located remote from the genitals, the same as in non-parturient women, a number of instances of which were given. Some cases of erysipelas were

also given which could be traced to no other cause than cold and exposure to dampness, apparently independent of possible contagion.

Regarding prophylaxis of the puerperal diseases, added the writer, bi-chloride of mercury, antiseptic pads, and injections, with bare walls, floors, and other surroundings needed in small pox and typhus fever, are not a necessity in the lying-in chamber. In private practice, almost non-interference can be carried out, but under the present system of hospital construction this plan can rarely be so absolute.

Several pages were devoted to giving his experience while resident surgeon at Charity Hospital, New York, at Maternity Hospital, etc., and statistics which, compared with those given by Dr. Garrigues, do not well correspond with the latter.

From August, 1880, to December, 1880, there were confined in Maternity proper 50 selected cases; of these, five, or 10%, died of puerperal metritis, septicæmia, or peritonitis. In the waiting wards during the same months, there were confined 72 cases, also selected; of these, six died, only three of which, or about 4%, died of septic infection. During October and November, the writer delivered in the waiting wards alone 25 women, of whom one died, and she of extensive heart lesions and pulmonary œdema. During these same months, 30 out of the 50 cases cited from the Maternity records, five fatal cases occurred, making a mortality for the two months of 16⅔% from septicæmia at the Maternity proper.

In 1875, the first year of the occupancy of the Maternity Hospital, there were 570 deliveries, with a mortality of fifteen, or 2.67%. In 1881, the mortality fell to 2.36%; in 1877, it rose to 6.67%, the reasons of which were elaborately dwelt upon.

During the service of Dr. B. Wood at the Maternity, of 68

cases there were three deaths from all causes. In the next two months, of 62 cases three deaths occurred, one of which was due to septicæmia. The grand total for the waiting wards and pavilions from August, 1880, to April, 1881, was 202 cases, with a mortality of twelve, only five of which, or a little more than 2½% were due to septicæmia, or puerperal fever. Of 130 cases, the writer stated, the let-alone plan of treatment was more rigid than his own, vaginal injections not being allowed. From April, 1881, to April, 1882, 423 cases were delivered, with but two deaths from puerperal fever. The treatment of this series was also non-interference. On the other hand, the writer stated, he has seen the temperature rise and pelvic inflammations follow the use of frequent vaginal injections; and cases which may eventuate in puerperal septicæmia and lead to a fatal issue would often do well and make a perfect recovery if left alone and kept quiet and free from curious visitors. As for prophylactic intra-uterine injections, the man who uses them will sooner or later come to grief in making too general use of this procedure.

"Placental compression," or Crede's method, of "pressing it out," is almost invariably absurd and pernicious. No more harm or serious result is likely to arise at the present time from a few minutes retention of the placenta than there was centuries before Crede was ever heard of. Without wishing to underrate the importance of freeing the womb from putrescible substances, the writer deplored the practice of inserting one's hand into the uterine cavity, seeking for an imaginary piece of placenta or for portions of secundines of microscopic size.

Another, yet more clear, illustration of the advantages of the non-interference plan of treatment in obstetrical practice was cited while the writer acted in the capacity of Resident

Surgeon of the New York State Hospital for Emigrants, where the deaths occurring from septicæmia were at the minimum. A year since a so-called "reform" was instituted there in the emigration service; the prophylactic injections and complicated manipulations were introduced, and with the direct and immediate effect of increasing the mortality rate, which became alarmingly high. Simultaneously, upon Ward's Island, there were present a large number of Russian Jewish refugees, who were filthy and mentally despondent. Upwards of ninety of these women were delivered without a death. There were numerous forceps deliveries, but there was absolute non-interference in the after-treatment. Here was a good opportunity to compare fancy midwifery results with the let-alone method.

Primary Operation for Perineal Lacerations.—In severe lacerations the primary operation is very essential, and often productive of the best results; but the tendency is towards too much routine practice in this respect, especially in hospitals. Those of less degree will heal of themselves. Chromated catgut is probably the best material for sutures to be used in deep and extensive lacerations which it is desirable to repair at once, and thus diminish the surface for septic absorption; but if a laceration extend completely into the rectum the tendency is to the secondary in preference to the primary operation. Meanwhile, cleanliness and iodoform are the most important elements of treatment. In some cases the slight fever resulting from the sutures is likely to pervert the secretions and convert them into a favorable nidus for the development of bacteria. In general, the operation is very successful if properly performed. Instrumentation or passage of a catheter at frequent intervals is unnecessary. A bed-pan should be used, and a stream of iodized water from a fountain douche allowed to flow over the vulva during urination. Iodine is a

more efficient deodorizer than carbolic acid, being destructive to bacteria in a strength of 1 to 5000. Bichloride of mercury, if used, should be in very dilute solutions, and in view of its chemical action in forming albuminates its superior usefulness may be questioned. A few other general suggestions for this accident closed the succeeding few pages upon the primary operation.

Injections During Labor.—This is recommended by some of our antiseptic extremists.

Lydston's remarks condensed were—they are not only useless, but injurious, and all unnecessary manipulations, as introduction of the hands frequently within the rima vulvæ is prejudicial to the safety of the patient; and only that which is consistent with careful watching of the case should be attempted.

Tardy Delivery.—The use of the forceps at the second stage, and care in changing of linen of the patient, first by warming it, also the bed-pan before placing it under a patient, received full attention by the writer's pen.

Administration of Ergot.—This drug is undoubtedly prophylactic in puerperal diseases, for it produces uterine contraction and hastens involution. In fuller subjects and after severe or instrumental deliveries, give small doses of the drug with quinine for a week or ten days. Hour-glass contraction should be carefully guarded against before the placenta has been expelled, although this condition is rare. After labor, a pad of oakum placed over the vulva is much neater than a napkin. The potency of germs and the value of antiseptics are well appreciated, but the woman should now be interfered with as little as possible. We should regard labor as a physiological process rather than as pathological. Women are to-day entitled to the same natural advantages that they were long before syringes, antiseptics, and microscopes were ever dreamed of, although

when fetor or suppression of the lochia indicates danger, intra-utrine injections and other hygienic measures are demanded; and in these severe cases a glass tube after being introduced may be left in situ until danger is passed. Even constant irrigation may be advisable. Jones, of St. Paul, has recently reported several interesting cases in which they were useful. Sloan recommends suppositories of iodoform and eucalyptus. Curetting would not be proper except where portions of secundines were known to be left. The success, also, of the iodine treatment in typhoid fever ought to be a good basis for its use in septicæmia. Also antipyretics—as the salicylate of iron is almost specific in its action, this will often rapidly lower the temperature where quinine has failed. Then a judicious use of morphine and stimulants, with good nourishment, constitute (generally speaking) the proper management of puerperal septicæmia. The hot vaginal injections to be effectual should be given through a cylindrical speculum. The faradic current was spoken of as one of the best remedies to induce resolution of pelvic exudation. * * * General peritonitis complicated by septicæmia is the most fatal disease to which the puerperal woman is liable, the vital powers being overwhelmed by a most powerful poison. The treatment suggested for septicæmia comprises the measures already stated, in combination with very free use of opium or morphine or stimulants. Hot applications over the abdomen, or perhaps cold, may be a useful measure in this fatal malady and the support of the system in its efforts to rid itself of the poison already absorbed. About six pages of goodly advice to our esteemed bacteriophobic friends in the East, and to those having direct charge of Maternity Hospital, eloquently closed what probably is one of the most comprehensive papers upon a single topic ever presented to this Society. Many valuable formulæ and interesting

points in this review have been unavoidably omitted, although their merits may receive further attention at some future time.

Fracture of the greater tuberosity of the humerus, extending into the bicipital groove, was the subject of a paper read by Dr. F. C. Schafer, who simultaneously presented the case of a man 55 years of age suffering from this rare form of fracture. As the paper is not at our command, the following abstract is made from memory. Two years ago, the patient received an injury to his shoulder by falling forward from a height of only about three feet, resulting in fracture of this uncommon variety. The various fractures and dislocations of the joint were enumerated, and the characteristics of this lesion were given as follows: A flattening of the shoulder and an increase in its antero-posterior diameter, will at first suggest that there is a dislocation to deal with. This flattening is caused by the drawing backward of the fragment of bone by the attached muscles and consequent crowding forward of the head of the humerus. The displacement leaves a deep sulcus in place of the bicipital groove. However, crepitation confirms the diagnosis. After the subsidence of the inflammation consequent to the injury, there was partial fibrinous anchylosis of the joint, which was with great difficulty broken up. At the present time, upward and backward extension of the arm is but slightly limited, as was demonstrated by the mobility of the limb. The alteration in shape of the upper part of the bone is evident on palpation only, and is barely perceptible to the eye, even when we attempt to manipulate the joint. The patient being somewhat fleshy, precludes any exterior signs of deformity. There has been almost perfect recovery resulting from the form of treatment devised.

In conclusion, the speaker cited several cases of this variety of fracture, in which the diagnosis had been confirmed by

autopsy. Perhaps not more than ten cases of this fracture are on record. The patient was then examined by the members present, and its peculiarities informally discussed.

Owing to the late hour, and the fact that a number of members experienced surgeons and obstetricians had gone to Washington to attend the American Medical Association, the discussion of the papers was postponed until a future meeting.

A motion prevailed that the Society do adjourn.

L. H. M.

SELECTIONS.

GUN-SHOT WOUNDS OF THE SMALL INTESTINES. *By* CHARLES T. PARKES, M.D., *Professor of Anatomy in Rush Medical College, Chicago, Ill.*

[*Address of the Chairman of the Section on Surgery and Anatomy.*]

Mr. President and Gentlemen of the American Medical Association: The subject-matter of the remarks to be presented this morning was suggested to me by an article published in the *British Medical Journal* in 1882, from the pen of "that good man among men, and great man among doctors," J. Marion Sims.

The article in question was an appeal for operative interference in penetrating gun-shot wounds of the abdomen, in lieu of the "expectant treatment" so universally accepted and adopted by the profession, and which, in a few seemingly well authenticated instances, has led to recovery.

The appeal was uttered in behalf of the vast majority on the side of fatality attending these cases, and was based upon the deductions to be drawn from the recoveries following operations for diseases affecting the viscera of the abdomen and pelvis, during which the most terrible injuries have been inflicted upon the contents of these cavities—the peritonæum exposed for hours, as well as brought in contact with all kinds of foreign and usually irritating substances.

It is scarcely necessary for me to affirm in your presence the fact that, with few exceptions, the older writers and surgeons

advocate the "expectant treatment" in the management of these injuries, while the younger writers and surgeons favor operations, pinning their faith upon the wonderfully favorable results attending the practice of Listerism, the purest of antiseptic surgical methods.

During the past few months I have instituted and carried out, with the valuable assistance of Mr. J. McDill and Drs. Anthony, Freer and Bolles, a series of experiments for the purpose of ascertaining the results to be obtained by immediate operations after these wounds, with the hope that the relation of the attending circumstances and events would be interesting as well as useful, by adding to the data now in our possession other data, from which may be determined more intelligently the course of action to be adopted when these cases come under our charge for treatment.

No attempt will be made to review the great question of penetrating gun-shot wounds of the abdomen, which would lead me beyond the scope of the paper. Nothing but a fair recital of the history of the experiments, with some application of the conclusions to be drawn therefrom, will be undertaken. With this intent in view, there will be presented to you the accompanying phenomena, the manner of treatment and results of thirty-seven intentional gun-shot wounds of the abdomen, confining my attention entirely to my own observations, and exhibiting to you such specimens as I have been able to preserve, taken from the animals; both of those which died, and of those which were sacrificed, after recovery, to obtain the specimen. Experiments of like nature have been made upon animals by very many surgeons, previous to the application of their convictions of the necessity of certain procedures to relieve disease or the effects of injury on the human body.

No preparation of the animals selected for experiment was

made, either as to choice of physical condition or surrounding circumstances, except that they were anæsthetized previous to being hurt. The wounds were produced by the ordinary Smith and Wesson revolver of 22, 32, 38 and 44 caliber, and by the 22 caliber rifle. The shots were given at short range, so the damage done by the bullet fairly represents the injury met with, either in military or civil practice, as the results of shots from the firearms now in use.

At first, no attempt was made to give a definite direction to the course of the bullet, other than that it should perforate the abdominal cavity. The results soon confirmed the fact so well known, that the larger number of patients suffering from such wounds never come into the hands of the surgeon, their injuries proving rapidly fatal.

This ending, we can readily understand, must be a common one, when we bear in mind the construction and nature of the viscera contained in the cavity, especially their great vascularity, having vessels of immense size supplying them with, and carrying away from them, the blood necessary for their nutrition and the performance of their special functions; not to mention the main systemic artery and vein coursing through the cavity in a position rendering them readily liable to perforation, death following speedily.

It was also ascertained that a severe perforating and lacerated bullet wound of the viscera, such as of the kidneys, of the spleen, and of the pancreas, could not apparently be treated successfully in any other way than by an absolute removal of the injured organ; and notwithstanding the reported successful removal of almost every important organ of the abdomen by one surgeon or another, the conclusion was reached that some of these organs must be left *in situ*, in order that the functions of life may be carried on.

Hence we were compelled to exert such control over the course of the missile as to have it produce a wound of the nature of those likely to come, and actually coming, under the care of the surgeon; so that the injuries became those confined to perforations and injury of the intestinal tube, with occasionally the injury of some of the larger special organs.

It will not be amiss to recall to your minds, very briefly, some of the triumphs of abdominal surgery, and more especially to impress the fact that shot wounds of the cavity and contents present many questions of prime importance which are not met with in, and do not complicate, ordinary operations for disease or injury with any free, external wound.

The removal of the spleen for acute wounds nearly always results in recovery; so also one kidney has been removed successfully, either for disease or injury, often enough to place the operation of nephrectomy among the list of justifiable undertakings.

Again, wounds of the intestinal tube of all degrees of severity, up to complete division by the resection of portions of the entire caliber thereof, have been successfully treated by surgeons, as is proved by the experimental researches of Dr. Traverse, the eminent Prof. S. D. Gross, Dr. Bell, and others, and confirmed by the experience of many surgeons during operations upon the human being for diseases of these cavities. Still, in each of the examples mentioned, the circumstances were entirely different from what is found present in perforating gun-shot wounds of the abdomen. In the former, the peritoneal cavity was clear of blood and other extraneous substances; the prevention of their entrance entirely under the control of the operator. In the latter, blood in large amounts was always found present; and the peritonæum was smeared with the contents of the intestinal tube, necessitating prolonged

efforts to secure a cavity clear of all hurtful substances. Of necessity, the latter cases would be least likely to escape the probabilities and dangers of subsequent inflammation of the serous membrane.

Primary resection of portions of the intestinal tube, or entire removal of separate organs, are operations comparatively easy of performance, and are not necessarily attended with any damage to or exposure of any other portions of the abdominal cavity, outside of the immediate proximity of the site of the operation.

Extravasation and hæmorrhage should be entirely prevented and controlled; and the peritoneal sac can be maintained perfectly clean during the time of, and after, all the procedures required by the operation.

After gun-shot wounds, besides the resection or removal of any special organ required, there is great shock, and prolonged manipulation is necessary to obtain a proper cleanliness.

The recital in detail of each experiment would be tiresome and occupy too much time, so that your attention will be called only to the more important facts and circumstances determined by them.

There will be published with the paper a somewhat extended account of each experiment, from which individual inferences may be drawn. In addition, a short *resume* of the entire work will be given further along.

First comes the question of hæmorrhage and damage to blood-vessels, as this is primarily the most common and certain cause of death, and demands the surgeon's first attention. In its excessive amount, occurring rapidly and suddenly, is to be found the explanation of the cases which are immediately fatal. This result will surely happen when the largest arterial trunks are severed by the bullet; further, its copiousness and persist-

ency of flow, even when none but very small blood-vessels are divided, involve a matter of serious concern, if not a fatal issue, either from the amount of blood lost, or in predisposing to septic processes from blood decomposition.

There is a remarkable persistency in the flow of blood following the severance of vessels in the abdominal cavity, perhaps dependent upon the laxity of the tissues through which these vessels course, the absence of pressure from surrounding soft parts, and the lack of the peculiar influence of the atmosphere, either from its weight or clot-producing power.

When the abdomen is opened immediately after the transit of a bullet, its cavity is found to contain a large amount of blood, the quantity, of course, being in proportion to the size of the vessels wounded, but always a disproportionately large amount, no matter what their caliber; further, the flow is still going on from vessels of all sizes. There seems to be slight disposition to the formation of an obstructive clot in the mouths of the smaller ones, and slow retraction or contraction of the walls of the larger.

Bleeding stops only when the heart ceases to beat in a faint from excessive loss, or when the amount of blood is so large that by its bulk, and weight, and distension of the abdominal walls, it makes pressure sufficient to occlude the open vessels.

The conditions are very quickly altered after air is admitted through the abdominal section. Clots rapidly seal up the smallest vessels; the smaller arteries spurt less forcibly and soon cease beating; the larger ones contract and retract, just as occurs in the wounds of soft parts in other regions of the body. This is in accordance with, and corroborative of, the experience in hæmorrhages occurring in abdominal surgery in the human being. Few of us have failed to see cases like this: a patient dies suddenly, with all the symptoms of

acute prostrating hæmorrhage; post-mortem examination shows the abdominal cavity filled with blood; the blood is carefully cleared away in the search for the source whence it came; and when this is found, it is a matter of astonishment that such a vast amount of blood could come from so small a vessel. Perhaps it is a small vein of the ovarian venous plexus, or a minute vessel in the thin-walled sac of an extra-uterine fœtation, or the partially closed vessels in the shrunken stump of a recently removed ovarian or other tumor, or some recently divided adhesions, all of them vessels which, in any other part of the body, would be no item of concern to the surgeon, or need any of his special care to prevent bleeding from them.

The lesson taught by these facts is of imperative importance in all operations upon these cavities; and even if mastered, loses nothing by reiteration. Excessive hæmorrhage being certainly the principal cause of speedy death in severe gunshot wounds in this region of the body, where evidences of its presence are plainly exhibited, there can be no hope whatever of saving the lives of any of the wounded except by immediate abdominal section. This alone, by admitting air quickly, staunches the fast flowing current, and gives time for the application of the ordinary rules of surgery for the prevention of hæmorrhage.

In order to be safe from subsequent trouble, every divided blood-vessel must receive the surgeon's attention, occluding clots must be thoroughly sponged away, and in their stead must be placed the ligature or the sear of the actual cautery. If left without this restraint, and the abdominal opening be closed, the same conditions are restored as existed previous to the section; and as reaction comes on, bleeding will surely recur, and in large amount, leading to death from this cause alone, or furnishing a frequent source of septicæmia.

This fact again is corroborative of the experience of ovariotomists, the most successful being those who take the greatest pains to staunch all bleeding before closing the abdomen.

Following a resection of three or four inches of bowel and a ligation of two large subdivisions of the mesenteric artery wounded by the bullet, there occurred a mortification of several inches of the entire intestine above the site of resection. The mortified part corresponded with the distribution of the arteries wounded and ligated. This assuredly was an important fact to know, if at all likely to occur as the result of wounds of these arterial branches; even its accidental occurrence is a circumstance to be remembered. Its occurrence would surely add largely to the gravity of the cases in which it happened, probably necessitating a resection of a portion of the intestine corresponding to the area of distribution of the wounded vessel. The great freedom of anastamosis between the mesenteric arteries rather argues against their wounds being followed by any such hazardous result; still, the case recorded above required explanation. Two experiments were performed in order to determine whether destruction of the arteries alone was sufficient to lead to such mortification.

Both demonstrated that a closure of two or three of the largest subdivisions of the main mesenteric vessel was not in itself sufficient to produce death of the portion of intestine supplied by them. The experiments were as follows: an animal was anæsthetized, and the abdomen opened. A sufficient length of bowel was drawn through the opening to allow of the ligation of two large sets of vessels adjoining each, the ligatures including vein and artery. The parts were returned to the abdomen and the latter closed. At the end of thirty-six hours the wound was reopened. No very noticeable change was found in the intestine; pulsation had returned in the ligated

vessels beyond the ligature. The external wound was again closed. The animal recovered in a few days so as to be as lively as ever.

A second animal was etherized, and a ventral section made. Three large vessels were ligated (veins and arteries), before their division into any branches. These three vessels lay parallel with each other. A ligature was also thrown around the anastomosing branch near the intestine which connected with a fourth larger vessel. There followed immediately very marked whitening of the bowel. The parts were returned and the wounds closed. The animal recovered promptly from the effects of the ether and the immediate effects of the operation.

It remained quite well for six days, when it grew ill. The wounds were reopened. Pulsation had returned beyond the ligature. There was no sloughing or mortification of the intestine. It was congested slightly and seemed paralyzed, and was of wider caliber opposite the distribution of the ligated vessels; this was the only change. There was a great deal of very offensive matter in the peritoneal sac, and notwithstanding the high grade of inflammation, there was no adhesion of intestinal folds except at one point. Here there was found a perforation of the intestine. Out of the opening there protruded a piece of wood which, upon being pulled out from the cavity of the intestine, was found to be four inches long, and connected with a large mass of twine. This had evidently been swallowed by the animal, and had gotten along safely enough until it reached the inactive portion of the tube corresponding to the seat of operation, where it was forced through the tube by the strong contractions behind it. Unfortunately, the animal was killed by the ether during the examination. Aside from this accident, the animal had a good chance of recovery.

The complication of a complete resection of the bowel, with

a ligation of two or more vessels, is the only explanation to be given of the case where mortification occurred. The experiments prove that such result does not follow simple closure of the vessels by ligation.

The second item to be considered refers to the course of the bullet and the character of the damage done by it. Nothing can possibly be more uncertain and erratic than the track of the missile through the body. A contracting muscular fiber, an edge of fascia, the elasticity of the skin, a surface of bone, or a distended knuckle of intestine, each and all of these at times present obstructions sufficient to divert it from the direct line of its flight. It is certainly astonishing what very extensive and severe lacerations of the intestines are produced by so small a bullet as one of caliber No. 22, Fig. 1. c.; the entire circumference of the bowel at some points being mangled beyond recognition; again, it is equally surprising how minute are the perforations made by the large No. 44, Fig. 2. As a rule, the larger the caliber of the bullet the larger the wound.

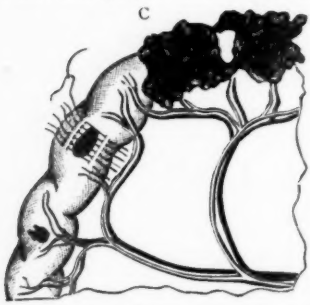

Figure 1.

An estimate of the direction of transit, based upon the points of entrance and exit, is purely conjectural, and furnishes no standard whatever by which we may judge of any supposed injury to any organs known to lie in such course. In one experiment, the bullet made four openings through the abdominal walls, and did no damage other than contusion of two knuckles of the small intestine and gouging the serous membrane.

The animal had a remarkably deep furrow along the course of the "linea alba." The bullet entered the right side of the ab-

men obliquely, two inches from the mid-line, perforated its walls, and coursing to the left, furrowed the peritonæum in its passage; was evidently deflected outwards, immediately before reaching the linea alba, by a knuckle of intestine, which it contused slightly.

Here it made its first exit through the walls, passed to the left side of the mid-line, again perforated the abdominal walls, and, furrowing the peritonæum upon the left side, finally made its second exit through the abdominal walls three inches to the left of the linea alba. Near its place of final exit, a second knuckle of intestine was found badly contused. The contusion was so severe and extensive that it was thought best to resect a length of one inch. The animal recovered.

In a second instance, the bullet entered the cavity about two inches to the right of the linea alba, on a line with the umbilicus, with a direction upwards and to the left side. It made its exit nine inches to the left of the mid-line, and just at the lower edges of the last rib. On opening the abdomen the stomach was found greatly distended, entirely concealing the other viscera from view, and presented two large perforations in its walls about two inches apart, from which some blood, mucus, and food were found running into the peritoneal sac. The wound to the right, in the stomach walls, was the smaller, and situated directly opposite the entrance perforation in the abdominal wall, having the same direction. The wound to the left in the stomach walls (two inches to the left) was the larger, very ragged, and had evidently been made by the bullet deflected forward at its first entrance into the stomach. After leaving the stomach the bullet impinged upon the inside of the abdominal walls just to the left of the mid-line, and then, instead of perforating them at that point, was again deflected upwards and to the left, merely furrowing the peritonæum along the remainder of its course to the point of exit mentioned. The

wounds of the stomach were inverted, as it were, into the cavity of that organ, by bringing its peritoneal surfaces surrounding the wounds in contact with each other by means of the continued catgut suture. The abdomen was carefully cleansed of blood, etc., and the wounds in the walls closed in the ordinary way. The animal speedily recovered from the injury, without any uncomfortable symptoms. During the recovery from the effects of the ether, the animal vomited considerable quantities of blood, giving an additional evidence of the perforation of the stomach.

There were two cases in which the bullets perforated the abdominal walls, and in their transit did no injuries to the viscera, in which the points of entrance and exit were five and six inches apart. In each instance the only damage done was a furrowing and laceration of the peritonæum along their entire courses, the blood from the track of injury falling into the abdominal cavity. In one experiment, the bullet failed to penetrate the abdominal walls and was subsequently dissected from between the muscles. On opening the cavity, quite a rent was found in the spleen opposite to the seat of external bullet wound, from which blood was freely flowing. There was neither abrasion nor perforation of the peritonæum. This case may suggest the probable cause of death in some fatal cases from non-perforating wounds. The laceration was evidently caused by concussion alone.

Other instances might be cited to illustrate the exceedingly great uncertainty as to the course taken by the bullet, and as to the organs probably impaired. They would also confirm the possibility of perforations of the walls without accompanying injury to the contents of the abdomen. Still, no instance was shown of failure to produce a wound thereof when the bullet's course lay among the intestines. Their safety followed deviation by glancing.

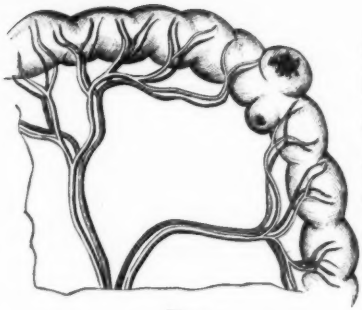

Figure 2.

The wounds of the intestines may be many in number and situated very near to each other (Fig. 3) so that one resection including all the openings will constitute the only operation that furnishes relief.

Again, the openings may be few in number and widely removed from each other; and if each wound is large, and the damage to the tube extensive, such as is usually produced by a 32, 38 or 44 caliber bullet, three or four resections are necessary. The latter are the most difficult cases to manage and most fatal in their results. The position of the points of entrance and exit of the bullet in the intestines is subject to immense variety, even in simple cases. It may involve only the top of a knuckle of intestine, merely opening the cavity thereof. The points may be so near each other that only a half inch or less of intestinal wall separates them from each other. (Fig. 1, a.) The bullet may merely cut off the mesenteric junction opening into the cavity more or less freely. The intestine is often perforated transversely near the middle, or longtitudinally; in the latter case the bullet, entering at one point, courses along in the cavity of the tube for some inches, and then makes its exit.

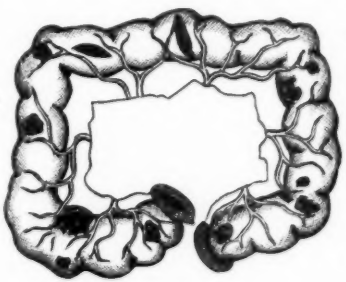

Figure 3.

All of these varieties depend upon the situation of the intestinal folds with reference to each other at the time of the transit of the bullet. One case

showed 10 complete perforations in 18 inches of length of the ileum, Fig. 3.

Extravasation of the contents of the tube was present in every instance where there existed the slightest degree of perforation. These contents were forced out into the peritoneal cavity, or on to the surface of the intestines, if the wound was large, by the bullet itself, and the normal tonic contractions of the bowels; and, if small, perhaps by the latter alone. This facility of extravasation agrees with my experience in wounds of the intestine in the human being. I have personal knowledge of two instances in which the medium-sized aspirator needle was employed to relieve tympanitic distension of the tube with success so far as getting rid of the gas was concerned, and giving great temporary comfort to the patient. Death ensued from the disease. Post-mortem examination in each case demonstrated the presence of fæcal extravasation at the seat of the needle puncture. It would not be an arduous task to collate instances of this accident in the practice of others, where this plan has been adopted. It is difficult to understand how any other result could follow a perforation, if there be contents at the seat of the puncture, when we remember how strong and constant is the action of the circular muscular fiber. It is stated that the protrusion or eversion of the mucous coat, which ensues very rapidly after complete division of the walls, acts as an immediate stopper of wounds of small size, say one-eighth of an inch in diameter. This may be true in incised wounds, but it was not shown to exist in a single one of the several hundred perforations coming under my inspection as made by the bullet. The latter tears away and lacerates the parts through which it passes, and perhaps paralyzes the muscular fibers in its immediate neighborhood, but whatever the cause, there was

no instance in which the eversion of the mucous membrane was sufficient to prevent extravasation.

Recognizing the very deleterious influence of this material upon the peritoneal membrane, this fact of the great certainty of extravasation adds another point to the argument in favor of abdominal section in these cases, as furnishing the only means by which this source of trouble can be absolutely eliminated.

As part of the extravasated material from the wounds of the intestine, it was an exceedingly common thing to find intestinal worms of all kinds, and in large numbers protruding from the rents or free in the serous cavity.

In the treatment adopted during these experimentations, it was found necessary to make an extensive external incision, freely exposing the abdominal cavity, in order that all the viscera might be thoroughly and carefully examined, and every wound brought within reach. In a majority of instances the median line gave space enough, in two the bleeding vessels could not be reached without a lateral prolongation toward the flanks.

There was no reason to suppose that the extent of the incision added very much, if at all, to the gravity of the operation. After opening the abdomen, the intestines were all turned out, critically examined for perforation or contusion, the situation of these fixed, and the hæmorrhage therefrom controlled by means of the snap forceps, after which wounds of special organs were sought for. If the substance of the spleen or the kidney was found perforated, the organ was immediately removed after ligating its blood-vessels, the stump being returned to the abdomen. If slight lacerations only at some point on the surface had been produced, these were closed by bringing peritoneal surfaces of the organ over the wound by means of the continued suture.

The peritoneal sac was then carefully and thoroughly cleared of blood and other extraneous substances by repeated sponging or irrigation. The intestines, which during this process had been protected by being enveloped in towels wrung out of warm water, were now cleanly sponged, while all unwounded portions were returned to the abdomen.

It seems to be of little consequence whether or not the intestines be returned to the cavity in any definite order — in fact, it is doubtful whether they are ever returned precisely to the same positions they originally occupied before being disarranged during the operation. Still, some care must be used in order to avoid the accident which happened in one experiment. After the divided ends of the intestine had been united, it was found that during the manipulation one of the ends had in some way been passed through an opening in the divided mesentery, so as to produce a figure of eight convolution in the tube. It was left in this shape. The animal recovered, and I have the specimen with me to demonstrate the perfectness and security of the union in the intestine at the place of reunion. The animal was sacrificed to secure the specimen six weeks after the operation. The abdominal cavity was quite free from evidences of inflammation, except where the misplaced folds lay in contact with each other. At this point slight peritoneal adhesion had formed between them.

Where several wounds occurred rather close together, severe enough to destroy a considerable portion of the integrity of the bowel, one resection was made to include all of them, even when the length of intestine removed measured ten inches or more. Where the points of injury were widely separated from each other and extensive damage done at each point, several resections of a length of the tube just sufficient to include the injured portions were made.

In the former case, in which several inches of the tube were

taken away, the mesentery was ligated as close as practicable to the intestine (Fig. 7), in sections corresponding to the number of blood-vessels going through it to the resected portions. The mesentery was then divided close to the intestinal wall, and a "V" shaped portion of it removed. After this, the tube itself was divided, and the wounded portion removed. One artery, always needing ligation, was found in the divided ends at the point of junction of the mesentery with the intestine. Before the final division of the intestine, its contents were pushed back out of the way, compression exercised upon its walls by a pair of forceps or a temporary ligature, in order to prevent extravasation of its contents through the divided ends. The mark of constriction made by the forceps or ligature, used to close the lumen of the bowel, was to be plainly seen several days after the operation. The safest compression can be made by an assistant's fingers. Results soon demonstrated the paramount necessity of carefully selecting the place for final division of the intestine, in order to avoid sloughing of the edges approximated together, the results being best in those cases where the division was made close to the point at which any given mesenteric artery approached nearest to the intestine, as compared with those where the cut was made in the intervals between any two branches of these vessels, and this was seemingly dependent on the better supply of blood belonging to the former cases. Immediately after division of the intestine, there followed an instantaneous, regular and considerable contraction of the caliber of the tube (Fig. 4, a), close up to the divided edge, caused by the action of the circular muscular fiber. The diameter was often diminished more than half by this contraction. This persisted for a time, but was soon followed by an eversion of the mucous membrane, which rolled out and over the constricted portion in a remarkable manner. (See Fig. 4, a, b and c.)

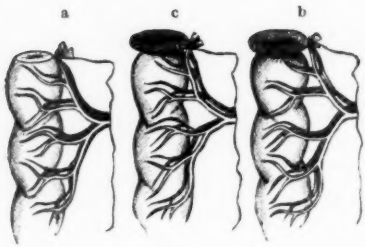

Figure 4.

This protrusion of the mucous membrane forms a serious obstacle to easy and close approximation of the ends of the bowel in the efforts to bring them together by sutures; and, when turned into the bowel during such procedure, diminishes its caliber considerably, although it was not demonstrated that the obstruction was ever sufficient to prevent the passage of the intestinal contents. Several efforts were made to get rid of it, and overcome the seeming delay caused by its presence, but all these were finally abandoned.

It was pared away with the scissors; it was dissected up from the other coats for a quarter inch from the edges, but the conclusion was finally reached that instead of being a harm, its presence was useful in giving support, protection, and perhaps vascularity to the freshly sutured edges; at least, in all instances where it was removed, the stitches were found torn out and union defeated; in no instance where it was left entire did there fail to be union in some part, and no sutures gave way when properly applied.

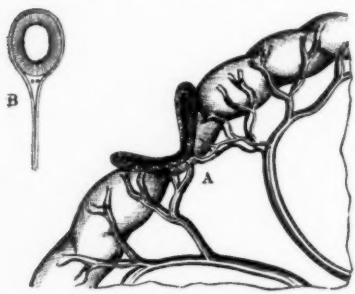

Figure 5.

In all instances where a perforation was severe enough to require a resection of the wounded part, it was found advantageous to leave, if possible, a strip of the bowel near the mesenteric junction (Fig. 5, A), taking out the wounded portion by means of a "V"-shaped incision. The part left acted as a support to the wound,

avoided division of the blood-vessels at this point, opposed the action of the longitudinal fibers, and in no instance in which this plan was adopted was there any appearance of separation of the wound or any displacement of stitches. In perforations through the stomach, the wound did well after drawing the peritoneal surfaces some distance from the edges thereof, over it by means of the continued suture, thus converting it into a linear wound (Fig. 6 A). The same plan was adopted with success in abrasion and small perforations in the small intestines. (Fig. 6 B.)

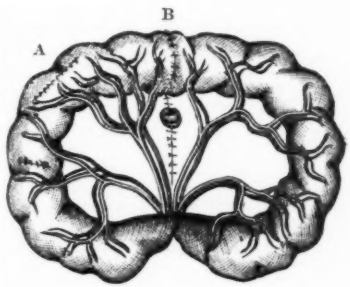

Figure 6.

This way of treating the bullet openings in the bowel is susceptible of much wider application than would appear possible at the first glance. I am quite well satisfied that it will safely take the place of excision in not a few cases of quite severe injury. The torn edges of the wound can be turned in, and peritoneal surfaces fastened together, even in large wounds, with perfect confidence in the result of safe and secure adhesion following.

It seems probable that by far the greater number of successful cases will follow a single resection, even if that include a number of perforations, and involves eight or ten inches of bowel, in comparison with those cases where several excisions are made of wounded portions widely separated.

Perforations passing through the mesenteric surface of the intestine were found the most difficult to treat, and even if slight seemed always to require a complete excision. A partial excision of this surface of the bowel resulted in an acute-angled elbow which never did well.

The point of attachment of the mesentery with the bowel will usually be found the most troublesome to manage, in applying the sutures in restoring a complete division. (Fig. 5, B.) It is quite difficult to so place the sutures as to secure a perfect reinversion of the mucous membrane, to bring serous surfaces fairly in contact with each other, and to get a sound junction. The difficulty arises apparently from the manner in which the folds of peritonæum separate from each other before passing on to invest the bowel, leaving a little triangular interval filled with loose connective tissues, fat and blood-vessels. Now, if the suture fails to include the muscular coats of the intestine as well as the peritonæum at this point, the junction will surely give way and extravasation result. To make this point secure, the greatest care must be taken in placing at least three sutures (Fig. 5, B), this number being usually quite enough to include the troublesome area, and these should always be the first sutures applied. In placing the remaining sutures to complete the junction after placing the three sutures mentioned, at the mesenteric surface, it assists materially in the ease of application, saves time, and especially avoids trouble from the everted mucous membrane, to apply one at the most convex surface, and then one half way down, on each lateral surface. After this is done, the remainder can be introduced easily and rapidly. If introduced in a regular series, one after the other, all the way around, it is a very slow process; the mucous membrane is always in the way, the needle openings in the intestines are apt to be uneven, and it is altogether the poorest plan of proceeding. The advantages mentioned as gained by taking the course suggested, are certainly all of them items of importance, and have some bearing on the result. At best, these procedures will be found very prolonged and tedious. The material used by me for sutures was silk

and catgut—the latter for the continued, the former for the interrupted ligatures. No. 1 catgut; No. 2 silk. The needles were the full curved round needle, or ordinary straight sewing needle; the latter is the best. The sutures were introduced about the third of an inch, never less, from the divided edges, made to include the peritoneal and muscular coats, and brought out just free of the edge on one side, and were then reintroduced close to the edge, and made to include about the same amount and kind of tissue on the other side, being *very sure not* to allow the nedle to pass into the intestinal cavity. (Fig. 11.) Mr. Howse,* of London, proved conclusively in his cases of gastrotomy, that the fact of entrance of the needle into the cavity of the tube, carrying the thread with it, made the difference between success and failure, cases dying from peritonitis and extravasation when the entry occurred, and recovery following when the thread included only the peritonæum and muscular coats.

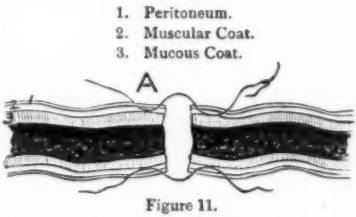

Figure 11.

Again, the everted tissue should be turned in before introducing the needle, so that it will pass through the rim of constriction. If entered too far away from the divided edge, too much tissue is turned into the intestine. When the mucous membrane was turned in, and the suture tightened, two broad surfaces of peritonæum were brought in contact. This you will recognize as Lembert's suture (Fig. 6, B), with one change. Lembert directs that only one and one-half line in width of tissue should be taken up by the suture. This amount of tis-

* Mr. Howse was the first surgeon to use the double row of sutures for the junction of serous surfaces together. Czerney's suture is an application of it to intestinal wounds. Its use is altogether too tedious, and gives no better result than the single suture including sufficient time.

sue will do very well in the closure of small slits, for which it was intended, and to which it was applied; but complete resection needs a much firmer hold to withstand the strain of peristaltic movements. *The fact is, that it makes no difference whatever what kind of suture is used, so that the principle of positively securing the application of two broad surfaces of peritonæum in contact with each other is certainly carried out. Jobert's, Gely's, and Czerney's double row of sutures were all given a fair trial*, but none of them resulted as well as this modified Lembert stitch. It never failed to be followed by good union when properly applied, with peritoneal surfaces brought together around the entire circumference of the intestine.

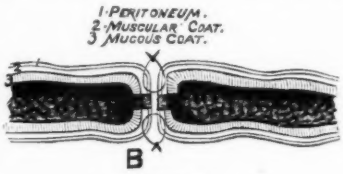

Figure 11.

The greatest number of mishaps followed drawing the sutures too tightly, which, if done, leads to death of the applied edges, and, of course, to failure. They must be drawn only sufficiently close to bring the surfaces fairly in contact, the subsequent swelling from obstructed circulation will hold the surfaces firmly together until glued to each other by the rapidly forming adhesive material.

The interval left by the incurving of the edges of the bowel, immediately after the completion of the operation, was found entirely obliterated, and the sutures covered up by effused lymph at the end of twenty-four hours. In one or two instances, where very small openings had been made in the bowel, they were occluded by passing a suture around the perforation, a short distance from its margin, pushing the wound into the cavity of the intestine, and then by tightening the suture the peritonæum was drawn together over it; a very satisfactory

plan of procedure where circumstances will permit its application.

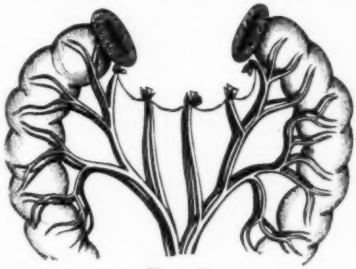

Figure 7.

The question of the proper disposition to be made of the divided mesentery, after removal of some length of intestine, is an important one to decide. No plan adopted proved entirely satisfactory. Previous to separation it was ligated in sections (see Fig. 7); the part beyond the ligature is apt to mortify and thus prove a focus for fatal inflammation. The tissue of the mesenteric membrane is not very vascular, and the vitality of the distal portion of the stump is seemingly best provided for by causing it to adhere to surrounding vascular parts.

In some cases the stumps were left free in the abdominal cavity; these all did badly, each showing mortification. In others the different sections were all included in one suture and then stitched to the bowel at the seat of operation, making as nearly as possible a continuous surface of mesentery.

These did much better, there being few instances of sloughing. When sloughing occurred, it seemed to be dependent upon and follow a too tightly fastened ligature. This method above mentioned of treating the divided mesentery is useful in another way: it gives support to the bowel at the point of resection, maintains the intestine in proper position by preventing bending, and also leaves fewer raw surfaces free in the serous sac. This last, a condition acknowledged to be the frequent source of serious trouble from faulty adhesions to surrounding organs, and from furnishing points from which septic absorption takes place.

A plan of dividing and treating the intestine and mesentery

has been suggested* to me as a possible improvement on those already noticed. It is really an application of the plan already recommended in single perforations. (Fig. 5, A). This is to make the separation through the intestinal walls three-eighths of an inch on either side of the mesenteric attachment

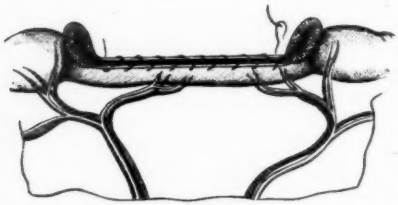

Figure 8.

(Fig. 8), tear away the mucous lining of the retained strip of bowel (Fig. 9), and draw the peritoneal surfaces thereof together by the continued stitch. (Fig. 8). This would avoid division of the blood-vessels going to the bowel, do away with the necessity of using ligatures, and leave no raw surfaces free in the abdominal cavity. The opening formed by the folding together where the bowel-ends are united, should be closed by the continued suture. (Fig. 10). This method was adopted in one experiment with an excellent result.

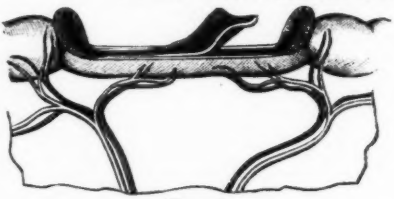

Figure 9.

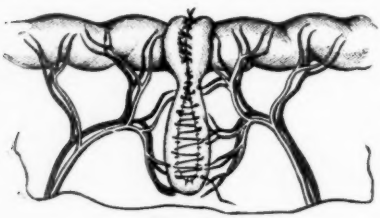

Figure 10.

Bleeding from slight lacerations of the spleen, kidney, or liver can be controlled by actual cautery lightly applied, perhaps the very best method to adopt. If the wound is a complete perforation of the body of the organ, the hæmorrhage is very great, rendering extirpation of the entire organ apparently the only sure way of surmounting the difficulty.

* Dr. John Bartlett, Chicago.

Quite frequently the entire mass of the greater omentum seemed to require removal. The bullet in the transit not only perforated it here and there, but passed along between its folds as well, leaving injured tissue and blood-clots of considerable size in its track. These clots disseminated themselves in the meshes in such a way as to entirely prevent their removal without tearing the tissue to shreds. When this condition was present in any degree the mass was amputated, after ligation, in sections. In a few instances these stumps gave rise to trouble, either from recurring hæmorrhage or mortification of the distal end.

In the aftertreatment it was often necessary to administer morphia to secure quiet. Very careful attention must be paid to the amount and kind of food given for some time after apparent recovery. One experiment resulted in failure after the lapse of three weeks from date of operation. The animal was lively, running about as freely as ever, all the functions normal, and the external wounds all healed, when it suddenly sickened and died, having tetanus accompanying rupture of the intestine, several inches above the seat of resection. Post-mortem examination showed masses of food and grit and greasy cloth, occluding the intestine, and distending it so enormously that rupture was produced; the tube at the seat of the operation was patulous and nearly of usual size. This animal was lost solely through neglect in the matter of feeding. Milk alone was given in all other cases for some weeks after operation. Certainly this is a matter of great importance, and suggestive of the proper care to be given after all such operations. Extreme emaciation occurs during the first week following the operation, and, if there is shown any likelihood of recovery, there follows a voracious appetite, which should be very sparingly gratified.

The circumstances under which these experiments were done, were such that it was absolutely impossible to carry out full antiseptic appliances. The external incision was treated with iodoform and oakum or absorbent cotton, and with two exceptions healed by first intention.

The bullet wounds through the abdominal walls were not probed nor disturbed in any way. Occasionally, when large and much contused, iodoform was poured on them. In only two instances did they suppurate or give rise to any trouble whatever, crusting over and healing rapidly. This result clearly enforces the rule of not disturbing the track of a bullet through the soft parts unless the most urgent reasons call for interference. The damage of a serious nature is not in the abdominal walls, but in the cavity; the nature of it can be better ascertained and the most satisfactory treatment adopted, after section through the linea alba, rather than by enlargement of the wound of exit or entrance, if any surgical interference be instituted.

In gun-shot wounds of any part of the body, it is not the injured muscular tissue or facia that causes grave concern, but the torn arterial trunk, or severed nerve, or fractured bone made by the missile, and here, too, incisions out of the course of the bullet track often furnish the best exposure of the parts for manipulation.

None of the wounds of entrance were perpendicular to the surface of the abdomen. All were more or less obliquely directed through the component tissues of the walls, so that they were valve-like in character and tended to close spontaneously. None of these cases presented any extravasation of the contents of the intestines through the external wounds, notwithstanding the lacerations of the tube were often very extensive, and considerable quantities of fæcal matter were found in the

peritoneal sac. The conclusion naturally follows, that the discharge of such matters, through the external openings, is not of frequent occurrence after the wounds under consideration. The absence thereof is far from being proof of the non-occurrence of perforation of the intestine.

It can scarcely be expected that extravasation through the wounds in the abdomen will often happen as an immediate occurrence. This is most likely to occur, if present at all, several days after the injury, following adhesion of the bowel to surrounding parts, and the accumulation of considerable quantity of matter.

There is no reason to suppose that interference with the adhesions to be met with in operations, done some time after the injury, would be followed by any worse consequences than that which follows their disruption during the performance of operations for ovarian or other tumors. The hazard supposed to attend their severance is certainly exaggerated. With a clean cavity they will do equally well in all cases.

These experiments have not developed any data which will aid in the positive diagnosis of the severity, or extent, or kind of injury done to the viscera, or render such diagnosis less difficult than heretofore, previous to abdominal section.

They go a step in advance of this by supporting the assertion that it is absolutely useless to expect immunity from perforations of the intestines when the bullet has traversed the cavity. It seems, and is infinitely more reasonable to subject a patient to the slight risk of an abdominal section, showing unwounded intestines, than to allow him to pass through the fearfully deadly peril of wounded intestines unrelieved, on the barren supposition that they may have escaped injury.

Some uncertainty as to its necessity is likely to arise, except in those cases showing extravasation of the contents of the bowels, or those where the free loss of blood, as indicated by the usual symptoms accompanying such accident, calls for aid. When doubt exists, and a critical condition of the patient argues severity of lesion, abdominal section surely seems to promise relief that can come in no other way. Exploratory incision of the abdominal walls has been done so often, and with so little hazard, as to entitle it to be classed as a procedure in itself almost destitute of danger. Such a conclusion is certainly supported by the results developed during these trials. The rule was, no trouble whatsoever from this incision.

No deduction can more justly or positively follow, as the result of these experiments, than that an incision *de novo*, through the linea alba, is the best method of procedure in the treatment of the class of wounds under consideration; a plan far preferable to enlarging either of the openings made by the bullet. It at once gives command over the entire cavity; therefore any lesion likely to result in harm is far less liable to be overlooked; it is the least vascular part of the walls; incisions thereof are more easily and perfectly co-aptated than elsewhere, heal readily and soundly, and as a consequence, the oncoming cicatrix is less likely to be followed by ventral herniæ.

Thirty-nine (39) animals were used in these experiments, exclusive of those dying from the effects of the anæsthetic. Two of the thirty-nine were used to demonstrate the effects of closure of the main branches of the mesenteric artery upon the nutrition of the intestines. Of the remaining thirty-seven (37), three cases died immediately after the shot

or from the effects of profuse hæmorrhage; one having a division of the aorta just below the mesenteric artery; the second had a large laceration of the kidney, with a wound of the renal artery; the third, a laceration of both kidney and spleen. One case, No. 4, had tetanus three weeks after operation, and is given a special position, simply owing to the presence of this condition as a complication in the case. The post-mortem examination, as already mentioned, developed other conditions which would have caused death, and which were no doubt the cause of the tetanic convulsions. Twelve of the remaining cases died inside of twenty-four hours, either from severe primary or recurring hæmorrhage, and the effects of the very extensive character of the wounds. Two out of this twelve (12) were cases requiring removal of the pregnant uterus, accompanied with many perforations of the bowel; death in both occurred from secondary hæmorrhage from uterine stumps — the ligature having slipped. Three (3) more had slight lacerations of the spleen and numerous perforations of the intestine. The spleen was removed and several inches of the tube excised in each case. In three (3) others, from twelve to twenty inches of the bowel was excised, and many arterial trunks severed. One of the twelve (12) had rapid mortification of five or six inches of the entire caliber of the bowel, apparently dependent upon the division of two large mesenteric arteries by the bullet, and also the resection of six inches of the intestine. The remaining three (3) of the number dying inside of twenty-four hours, are classified as having died of shock. On all of them the damage done by the missile was of excessive severity. The bullet was of large size (38 or 44 caliber), and the fire-arms possessing great penetrating

and lacerating power. There was not manifested in any case any recognizable evidence of shock aside from that following great loss of blood. The transit of the bullet made no noticeable impression upon the pulse or respiration. In every instance where signs of severe prostration became manifest through change in respiration or weakening of pulse, there was found profuse hæmorrhage to account for such condition. I am inclined to infer that the cases are exceptional indeed, in which purely nervous shock will give rise to symptoms severe enough to mislead one to perform an unnecessary ventral section; rather, when severe constitutional manifestations follow the passage of a bullet through the abdominal cavity, good cause for them will be found, as soon as the cavity is opened, in wounded viscera or blood-vessels, and this course will often be the only possible way of either actually saving life or even prolonging it. None of these twelve cases could possibly have lived longer than twenty-four hours after the injury received. Most of them would have died much sooner without the control of hæmorrhage, alone made possible by the opening.

Two cases of the series were subjected to the expectant treatment. These cases were chosen because their injuries did not seem very severe; the hæmorrhage was not great, and the prostration not extreme. Both died; the first in one day; the other lived five days. Post-mortem examination showed extensive extravasation of the contents of the bowel and septic peritonitis.

In one case an attempt was made to establish an artificial anus. The wounded intestine was resected, and the ends fastened to the edges of the abdominal incision. The animal died of septic peritonitis in three days. This trial was made

early in the experimentation, before any definite plan of procedure had been settled upon. This is the only experiment that has given rise to any regret, for I feel satisfied that, with a fair junction of the bowel and a clean abdomen, the animal would have been saved.

Eighteen of the thirty-seven (37) have thus far been accounted for; of the remaining nineteen (19), ten (10) died and nine (9) recovered.

The ten fatal cases lived from three days to three weeks. Peritonitis from one cause or another seemed to be the precursor of death. In six of them, mortification of the ligated stumps of the divided mesentery, together with mortification of the edges of the recently united bowel, were present. In the one that lived three weeks, death was the result of intestinal obstruction, caused by the adhesion of a fold of the intestine to the stump of mesentery left free in the cavity. An acute flexure was produced at the point, against which the contents of the bowel had accumulated in large quantity. A rupture was found above this mass, through which extravasation had taken place. The inflammation was so intense that everything was matted together, and the specimen so horribly offensive it could not be preserved. There was no separation at the point of operation on the bowel; it was thicker here than elsewhere; but full distension with water was allowed without leaking. All of these cases demonstrate conclusively the necessity of great care in the manner of dealing with the divided mesentery, and in the application of the sutures which bring the separated bowel-ends together. The remaining four furnished evidence of separation of the recently united parts of the intestine at the mesenteric junction. In all of them the thread failed to

include the muscular and fibrous coat of the bowel, holding only the peritonæum. The result was extravasation, and death followed.

It may be a matter of surprise to you that the percentage of successful cases presented is so small—nine out of nineteen of those surviving over 24 hours—so few out of so many. To me, knowing well the extremely adverse circumstances under which these experiments were performed, it is a matter of astonishment to have so many recoveries included in so few cases. It is suggestive to remember that all the recoveries followed the use of the modified Lembert method of bringing the peritoneal surfaces together, while in many of the failures, trials were made of other methods. Full six weeks have gone since the last case followed by recovery was subjected to operation. The first favorable case was treated four months ago. None of the animals present evidence of being other than in their usual health. The longest resection of intestine among the recoveries measured over six (6) inches and included four (4) perforations.

It is scarcely possible to do work of any kind under more disadvantageous surroundings than accompanied the performance of these experiments. The operative work was carried on, and the animals kept in the prosector's room of a medical college during the winter season, in the midst of the odds and ends and bad hygienic conditions of such a place. No better accommodations could be secured. The labor has been purely one of experimental inquiry, and not a striving after recoveries, implying a choice selection of attending circumstances and special preparations to that end; therefore, I judge it proper and fair to claim the results as satisfactory. These results certainly indicate that a better

showing is likely to follow where more satisfactory control can be had over both patients and surroundings than was present during these examinations.

They clearly demonstrate that a hopeful expectation of recovery may be entertained after operation, and suggest the nature of the injuries produced, what accident to avoid, and what treatment to adopt.

My confidence in coming before you with no better record is assured, when I remember that all of you are well aware of the great mortality of these injuries, under all circumstances. It must be large, surely, when Dr. Otis, in the surgical history of the war, says the authenticated cases of recovery can be counted on the fingers of one hand. It cannot be said that operative interference in these cases has as yet an established position. Still, perhaps Dr. J. Marion Sims looked with prophetic eyes upon the future, when he closed the article already referred to with the following words: "I have the deepest conviction that there is no more danger of a man's dying of a gunshot or other wound of the peritoneal cavity, properly treated, than there is of a woman's dying of an ovariotomy properly performed. Ovarian tumors were invariably fatal till McDowel demonstrated the manner of cure, which has now reached such perfection that we cure from 90 to 97 per cent. of all cases. And by the application of the same rules that guide us in ovariotomy to the treatment of shot wounds penetrating the abdominal cavity, there is every certainty of attaining the same success in these that we now boast of in ovariotomy."—*British Medical Journal*, March 4, 1882.

In a rather quaintly-written but richly-laden book on surgery, by Herr. L. Heister, Professor, etc., written in 1739, there occurs this passage:

"When the intestines are wounded but not let out of the

abdomen, and therefore the wounds are out of reach, the surgeon can do nothing but keep a tent in the external wound, according to the rules laid down at chap. V, and after this bleed the patient if his strength will admit of it, advising him to rest, eat abstemiously, and to lie upon his belly; the rest is to be left to Divine Providence and the strength of his constitution. But the question may be asked here whether a surgeon may not very prudently, in this case, enlarge the wound of the abdomen, that he may be able to discover the injured intestine and treat it in a proper manner. Truly I can see no objection to this practice, especially if we consider that upon the neglect of it certain death will follow, and that we are encouraged to make trial of it by the successes of others. Sacherus, in Programmate Publico, Lipsiæ, ed. 1720, mentions a surgeon who performed this operation successfully."

A period of 100 years and more has rolled away since Dr. Heister published his belief and reported recovery, to the time when Dr. Sims expresses his convictions—over a century of doubts, timidity, uncertainty, and gloomy misgivings, lightened only occasionally by some bold and resolute assertions. The future asks for action, and it is not unreasonable to assert that careful trials will accomplish successful results.

Avoiding any spirit of dictation, it seems proper to tabulate the following conclusions as an outgrowth of the experiments:

First. Hæmorrhage following shot wounds of the abdomen and the intestines, is very often so severe that it cannot be safely controlled without abdominal section; it is *always* sufficient in amount to endanger life by secondary septic decomposition, which cannot be avoided in any other way than by the same treatment.

Second. Extravasations of the contents of the bowel after shot injuries thereof are as certain as the existence of the wound.

Third. No reliable inference as to the course of a bullet can be made from the position of the wounds of entrance and exit.

Fourth. The wounds of entrance and exit of the bullet *should not be disturbed* in any manner, except to control bleeding or remove foreign bodies when present. They need only to be covered by the general antiseptic dressing applied to the abdomen.

Fifth. Several perforations of the intestines close together require a single resection, including all the openings. Wounds destroying the mesenteric surface of the bowel always require resection.

Sixth. The best means of uniting the wounded intestine after resection is by the use of fine silk thread after Lembert's method. It must include at least one-third of an inch of bowel tissue, passing through only the peritoneal and muscular coats, never including the mucous coat. The everted mucous membrane must be carefully inverted, and needs no other treatment.

Seventh. Wounds of the stomach, small perforations, and abrasions of the intestine, can be safely trusted to the continued catgut suture.

Eighth. Every bleeding point must be ligated or cauterized, and especial care devoted to securing an absolutely clean cavity.

Ninth. The best method of treating the stumps of divided mesentery is to save the mesenteric surface of the bowel as above indicated.

Tenth. *Primary abdominal section* in the mid-line gives the best command over the damage done, and furnishes the most feasible opening through which the proper surgical treatment of such damage can be instituted. Further, its adoption adds but little, if anything, to the peril of the injury.

(*To be continued.*)

THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

The first annual meeting of THE AMERICAN CLIMATOLOGICAL ASSOCIATION was held in Washington, D. C., May 3d and 5th, inst.

In the absence of Prof. Loomis, the President, Dr. F. I. Knight, of Boston, First Vice-President, occupied the chair.

The first day was occupied in adopting a suitable Constitution and By-Laws.

The second day was devoted to the reading of Papers, as follows: Address by the presiding officer, Dr. Knight. "The Aetiology of Pulmonary Phthisis," by Dr .E. F. Eastbrook, of Brooklyn; "The Effects of Sea Air upon Diseases of the Respiratory Organs," by Dr. Boardman Rood, of Atlantic City; "The Relation of Laryngeal Diseases to Pulmonary Diseases," by Dr. F. H. Bosworth, of New York; "Dryness," by Dr. Chas. Dennison, of Denver, Col., in which he dwelt on the following points:—"Variability *versus* Equability.—A rule for classifying climates as to dryness and desirability, based upon low, absolute, and relative humidity and preponderance of sunshine.—The influence of elevation, sunshine, cold, etc., in producing desirable dryness.—The physical effect of dryness on man;" "City Life and City Air Injurious to Consumptives," by Dr. Donaldson, of Baltimore; "The Use of Compressed and Rarefied Air as a Substitute for Change of Climate in the Treatment of Pulmonary Diseases," by Dr. J. Solis Cohen, of Philadelphia.

The following officers were elected for the ensuing year:

President—PROF. A. L. LOOMIS, New York.

First Vice-President—DR. F. I. KNIGHT, Boston.

Second Vice-President—DR. W. H. GEDDINGS, Aiken, S. C.

Secretary and Treasurer—DR. J. B. WALKER, Philadelphia.

Council—DR. J. H. TYNDALE, New York; DR. E. T. BRUEN, Philadelphia; DR. E. D. HUDSON, New York; DR. FRANK DONALDSON, Baltimore; DR. BEVERLY ROBINSON, New York.

BOOKS AND PAMPHLETS.

BOOKS AND PAMPHLETS RECEIVED.

Manual of Practical Hygiene; Parkes; vol. ii. Wm. Wood & Co.

Medical Ethics; Hamilton, Birminghams & Co.

Eczema and Its Management; Bulkley. Putnam's.

Da Costa's Medical Diagnosis; sixth edition.

A Yearbook of Surgery; Charles H. Knight. Putnam's Sons.

Medical Education. W. T. Keener.

Shakespeare as a Physician; Chesney. Chambers & Co.

Ophthalmology for the General Practitioner; Adolf Alt. J. H. Chambers & Co.

Sexual neurasthenia; George M. Beard. E. B. Treat, New York.

Die Diphtheria. Ihre entstehung, verhutung, und Behandlung; Dr. Med. C. G. Rothe, Leipzig. A. Abel.

Harper's Physicians' Vade Mecum; Wm. Wood & Co., 1884. W. T. Keener.

A Text-Book of Pathological Anatomy and Pathogenesis; sec. i to viii; Ernst Ziegler. McMillan & Co. W. T. Keener.

Hand-book of Vertebrate Dissection; part iii. McMillan & Co., 1884. W. T. Keener.

Pathology, Diagnosis, and Treatment of Diseases of the Rectum and Anus; Chas. B. Kelsey.

Wood's Library of Standard Medical Authors. 1884. W. T. Keener.

Practical Manual of Obstetrics; Dr. E. Verrier.

Wood's Library of Standard Medical Authors. 1884. W. T. Keener.

One Hundredth Anniversary of the Foundation of the Medical School of Harvard University.

Congenital sipoma, Jacobi.

Proceedings of the Naval Medical Society.

Removal of the Ovaries and Fallopian Tubes; Batty-Tait Operation. Thomas H. Hawkins. 1884.

Transactions of the American Ophthalmological Association. 1883.

Some Recent Progress in Diseases of the Nervous System; Talbot Jones, M. D.

The Treatment of Habitual Constipation; Henry N. Josselyn.

Practice at the County Infirmary; A. W. Hagenbach.

The Symptoms and Diagnosis of Malaria in Children; S. Emmett Holt.

Lister's System of Anti-Septic Wound Treatment Versus Its Modifications; B. A. Watson.

Annual Address Before the American Academy of Medicine; Henry O. Macey.

Suicide from a Medico-Legal Standpoint; J. E. McNeill.

Uterine and Ovarian Irritation a Cause of Insanity; E. S. Dalberg-Norred.

Timely Cathesis; Thomas H. Reynolds.

The Reciprocal Attitude of the Medical Profession and the Community; Alexander Hutchins.

Alcohol as a Food, a Medicine, a Poison, and a Luxury; Geo. C. Pitzer.

The Opium Psycho-Neurosis, Chronic Meconism or Papaverism; C. H. Hughes.